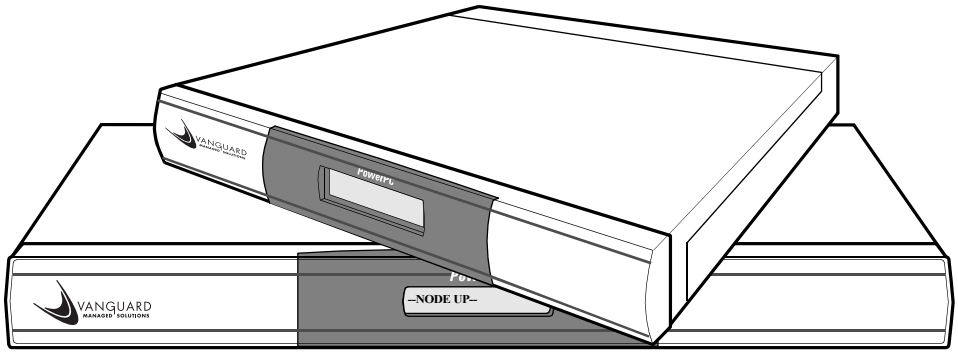
Vanguard Managed Solutions



Vanguard 6435/6455
Installation Manual

Notice

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

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This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

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This product was verified under test conditions that included use of shielded DTE cable(s). Leased line cables with 1.5 turns through a ferrite cylinder were also used. Use of different cables will invalidate verification and increase the risk of causing interference to radio and TV reception.

You can obtain the proper cables from Vanguard Managed Solutions.

Telecommunications Regulations

Equipment that complies with Part 68 of the FCC rules includes a label or permanent marking on the printed circuit board that connects to the network that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (*e.g.*, 03 is a REN of 0.3).

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult a trained technician.

Equipment that meets the applicable Industry Canada Terminal Equipment Technical Specifications is conformed by the registration number. Equipment that complies with Industry rules includes a label or permanent marking on the printed circuit board that connects to the network. The abbreviation, IC, before the registration number signifies that the registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

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Contents

Special Notices and Translations
Customer Information

Chapter 1.

About the Vanguard 6435/6455

Vanguard 6435/6455 Description 1-2
Features 1-3
Applications 1-7
PRI Supplementary Service 1-12
Vanguard 6455 Requirements for Bisync 1-15
Enable Ease of Configuration 1-16

Chapter 2.

Hardware Description

Enclosure 2-2
Motherboard 2-6
Vanguard Daughtercards 2-11
Enhanced Vanguard Daughtercards 2-19
10/100BaseT Enhanced Daughtercard 2-20
ATM Enhanced Daughtercard 2-22
T1E1 ATM Port Configuration 2-24
Vanguard 6435 and 6455 ATM Compression Support 2-25
Vanguard 6455 Option Cards 2-26
SDB4 Option Card 2-27
Token Ring Card 2-29
Voice over IP Convergence Card 2-30

Chapter 3.

Installation and Replacement

Checking Your Shipment Contents 3-2
Installing The Vanguard 6435/6455 3-3
Installing the Standalone Version 3-4
Installing the 6455 Rack Mount Version 3-6
Thermal Considerations 3-8
Cabling Your Vanguard 6435/6455 3-9
Modifying Your Vanguard 6435/6455 3-15
Accessing the Motherboard 3-16
DIMs, SIMMs, DIMMs and Switches 3-21
Installing/Removing Enhanced Vanguard Daughtercards 3-27
Installing/Removing Vanguard 6455 Option Cards 3-29
Installing/Removing the Lithium Battery 3-31
Installing Flash and CMEM 3-33

Contents (continued)

Chapter 4.

Powering Up Your Vanguard 6435/6455

Power Up Procedure 4-2
Power Up Sequence 4-3
Operating Front Panel Messages 4-5
Front Panel Display Messages 4-6
Loading the Software 4-7

Appendix A.

Specifications

Appendix B.

Software License and Regulatory Information

FCC Part 68 and Telephone Company Procedures and Requirements for DSU, T1, and ISDN Interfaces B-2
Product Declarations and Regulatory Information B-4

Return Procedures

Overview

Introduction

This installation describes features, hardware, specifications, and applications for the Vanguard 6435/6455.

Note

For information on operating system software and configuration, see the *Vanguard Basic Configuration Manual* (Part Number T0113).

Audience

This manual is intended for people who install and operate the Vanguard 6435/6455.

How to Use This Manual

The following table describes the contents of this manual:

This Chapter	*Description*
Chapter 1	Vanguard 6435/6455's hardware and software features.
Chapter 2	Description of the Vanguard 6435/6455 hardware features and components.
Chapter 3	Installing and replacing Vanguard 6435/6455 hardware including cards and motherboard.
Chapter 4	Powerup procedures and software loading.
Appendix A	Product specifications.
Appendix B	FCC and Telephone Company procedures and requirements.

Special Notices

The following notices emphasize certain information in the guide. Each serves a special purpose and is displayed in the format shown:

■Note

Note is used to emphasize any significant information.

Caution

Caution provides you with information that, if not followed, can result in damage to software, hardware, or data.

Warning

Warning is the most serious notice, indicating that you can be physically hurt.

Simplified Chinese

特别通告

以下通告强调指南中的某些信息。
每条信息均有一个特殊的目的并以如下格式显示:

■注解

注解用于强调任何重要的信息。

切记

切记提供您这类信息，如果不遵照信息的要求，可能导致软件、硬件或数据的损坏。

警告

警告是最严重的通告，表明您的身体可能被伤害。

Danish

Særlige overskrifter

Følgende overskrifter fremhæver nogle af oplysningerne i vejledningen. De tjener hvert et specifikt formål og vises i følgende format:

■Bemærk

Bemærk anvendes til at fremhæve vigtig information.

Forsigtig

Forsigtig understreger oplysninger, som, hvis de ikke bliver fulgt, kan føre til beskadigelse af software, hardware eller data.

Advarsel

Advarsel er den mest alvorlige overskrift, og tilkendegiver mulig personskade.

Dutch

Bijzondere vermeldingen

De volgende vermeldingen besteden extra aandacht aan bepaalde informatie in de handleiding. Elke vermelding heeft een eigen nut en wordt in de volgende opmaak weergegeven:

Opmerking
Een opmerking wordt gebruikt om belangrijke informatie te benadrukken.

Let op

Dit kopje geeft aan dat u de beschreven instructies moet volgen om schade aan de software, hardware of gegevens te vermijden.

Waarschuwing

Een waarschuwing is de belangrijkste vermelding. Indien u deze niet volgt, kan dit tot lichamelijke verwondingen leiden.

Finnish

Erityisilmoitukset

Seuraavat ilmoitukset korostavat tiettyjä oppaan tietoja. Kullakin on oma erikoistarkoituksensa ja ne esitetään seuraavassa muodossa:

Huomaa
Huomautusta käytetään korostamaan tärkeätä tietoa.

Vaara

Vaarailmoitus antaa tietoa, jonka huomiotta jättäminen voi johtaa ohjelmiston, laitteiston tai tietojen vahingoittumiseen.

Varoitus

Varoitus on kaikkein vakavin ilmoitus ja se kertoo mahdollisesta loukkaantumisriskistä.

French

Messages spéciaux

Les messages suivants mettent en valeur certaines informations dans le guide. Chacun d'eux remplit une fonction spéciale et est affiché dans le format indiqué :

Important
Important est utilisé pour souligner des informations critiques au sujet d'une procédure.

Mise en Garde

Une mise en garde vous fournit des informations qui, si elles ne sont pas observées, peuvent se traduire par des dommages pour le logiciel, le matériel ou les données.

Avertissement

Un avertissement constitue le message le plus sérieux, indiquant que vous pouvez subir des blessures corporelles.

German

Besondere Hinweise

Durch die folgenden Hinweise werden bestimmte Informationen in diesem Handbuch hervorgehoben. Jeder Hinweis dient einem bestimmten Zweck und wird im dargestellten Format angezeigt:

Wichtig

WICHTIG wird zur Betonung signifikanter Angaben zu Vorgehensweisen verwendet.

Vorsicht

Ein Vorsichtshinweis macht Sie darauf aufmerksam, daß Nichtbefolgung zu Software-, Hardware- oder Datenschäden führen kann.

Warnung

Eine Warnung weist Sie darauf hin, daß ernsthafte Körperverletzungsgefahr besteht.

Italian

Simboli speciali

I seguenti simboli, ciascuno con una speciale funzione, evidenziano determinate informazioni all'interno del manuale. Il formato è quello riportato qui di seguito.

Nota

Questo tipo di avvertimento viene utilizzato per evidenziare tutte le informazioni significative relative ad una procedura.

Attenzione

Questo tipo di avvertimento fornisce informazioni che, se non vengono seguite, possono provocare danni al software, all'hardware o ai dati.

Avvertenza

Questo tipo di avvertimento indica la presenza di condizioni di rischio che possono causare lesioni fisiche. Si tratta del simbolo più importante al quale prestare attenzione.

Japanese

特別表記

ガイド内では、以下の表記を使って特に注意する必要のある情報が提供されます。各表記にはそれぞれ目的があり、次の形式で表示されます。

■ 重要
重要な情報が記述されています。

注意

記述されている内容に従わない場合、ソフトウェア、ハードウェア、またはデータが壊れる可能性があります。

警告

最も重要な情報が記述されています。身体的な障害を被る可能性があります。

Korean

일러두기

이 설명서에는 사용자에게 특정한 내용을 강조하기 위해서 다음 내용이 포함되어 있습니다.

■참고
중요한 정보를 강조하는데 사용합니다.

주의

소프트웨어나 하드웨어, 또는 데이터를 손상시킬 수 있으므로 주의가 필요한 상황을 알립니다.

경고

사용자의 안전에 위험을 알리는 가장 심각한 수준의 경고입니다.

Norwegian

Spesielle merknader

Merknadstypene nedenfor representerer en bestemt type informasjon i håndboken. Hver merknadstype har en spesiell hensikt og vises på følgende format:

■**Merk**
Merk brukes for å fremheve viktig informasjon.

Forsiktig

Forsiktig gir deg informasjon om situasjoner som kan føre til skade på programvare, datamaskin eller data dersom den blir fulgt.

Advarsel

Advarsel er den mest alvorlige merknaden og indikerer at du kan bli fysisk skadet.

Portuguese/Portugal

Avisos Especiais

Os avisos que se seguem realçam certas informações neste guia. Cada um deles serve um objectivo especial e é visualizado no formato apresentado:

Nota
Nota é utilizado para realçar qualquer informação importante.

Atenção

Atenção faculta-lhe informações que, se não forem cumpridas, poderão provocar danos no software, hardware ou nos dados.

Cuidado

Cuidado constitui o aviso mais grave, o qual indica que poderá ficar fisicamente ferido.

Spanish/Spain

Notificaciones especiales

Las siguientes notificaciones ponen énfasis sobre determinada información de la guía. Todas tienen un propósito especial y se muestran con el formato siguiente:

Nota
Las notas se utilizan para destacar determinada información de importancia.

Advertencia

Las advertencias le proporcionan información que debe seguirse, si no desea que el software, el hardware o los datos puedan verse dañados.

Aviso

Los avisos son las notificaciones de carácter más importante e indican la posibilidad de daños físicos para el usuario.

Swedish

Speciella beteckningar

Följande beteckningar betonar viss information i handboken. Var och en har ett speciellt syfte och visas i formatet nedan:

OBS!
OBS! används för att betona viktig information.

Viktigt

Viktigt ger dig information som, om den inte följs, kan resultera i skada i programvara, maskinvara eller data.

Varning

Varning är den mest allvarliga beteckningen och den indikerar att du kan skadas fysiskt.

Customer Information

Customer Questions

Customers who have questions about Vanguard Managed Solutions products or services should contact your VanguardMS representative or visit this website for product, sales, support, documentation, or training information:

http://www.vanguardms.com/

Comments About This Manual

To help us improve our product documentation, please complete the comment card included with this manual and return it by fax to (508) 339-9592. If you prefer, provide your name, company, and telephone number, and someone in the documentation group will contact you to discuss your comments.

Customer Response Card

Vanguard Managed Solutions would like your help in improving its product documentation. Please complete and return this card by fax to (508) 339-9592; Attention: Product Documentaton, to provide your feedback.

To discuss comments with a member of the documentation group, provide telephone information at the bottom of this page. **Thank you** for your help.

Name _____

Company Name _____

Address _____

_____

_____

Document Title: Vanguard 6455/6435 Installation Manual

Part Number: T0166, Revision J

Please rate this document for usability:

☐ Excellent ☐ Good ☐ Average ☐ Below Average ☐ Poor

What did you like about the document? _____

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What information, if any, is missing from the document? _____

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Please identify any sections/concepts that are unclear or explained inadequately.

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Additional comments/suggestions. _____

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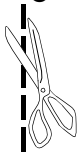
Telephone _____ Ext. _____ Best time to call_____

Cut Here



Chapter 1
About the Vanguard 6435/6455

Overview

Description

The Vanguard 6435/6455 products provide wide area network (WAN) access for offices that depend on efficiently consolidating legacy protocols (SNA/SDLC and BSC) with Voice and LAN traffic over IP, Frame Relay, X.25, ISDN, and NX64 T1/E1 services. In brief, here is the difference between the Vanguard 6455 and 6435:

- Vanguard 6435: Supports two Async/Sync ports, two Async ports and an Ethernet port, as well as up to three optional Vanguard Daughtercards (two of which can be Enhanced Vanguard Daughtercards).
- Vanguard 6455: Provides the functionality of the Vanguard 6435 plus it can support two Option Cards.

Figure 1-1 shows the front panels of a Vanguard 6435 and a Vanguard 6455.

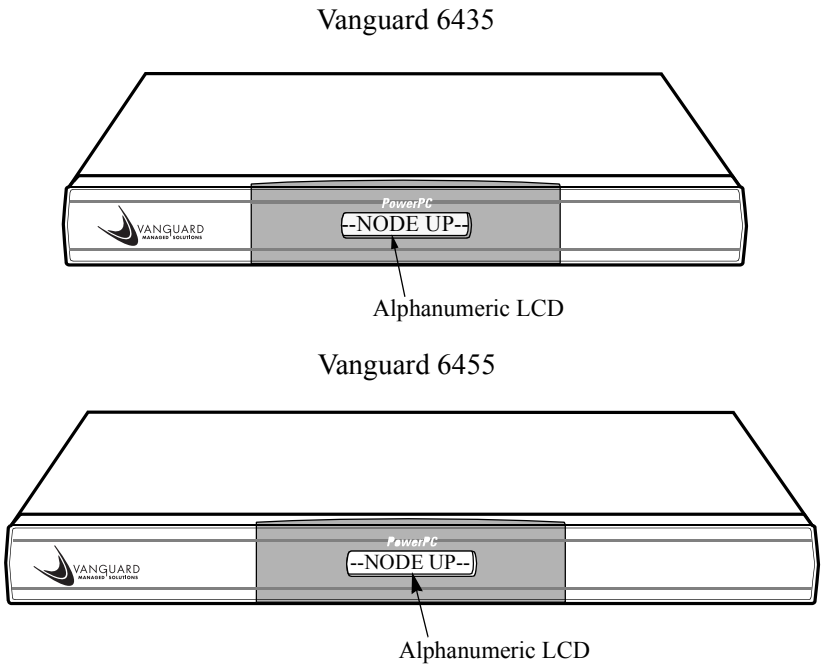


Figure 1-1. Vanguard 6435/6455 Front Panels

For a detailed description of the Vanguard 6435/6455 and its features, refer to the "Vanguard 6435/6455 Description" section on page 1-2 and the "Features" section on page 1-3.

For descriptions of the Vanguard 6435/6455 Daughtercards, Option Cards, and other hardware components, refer to the appropriate sections in Chapter 2, Hardware Description.

Vanguard 6435/6455 Description

Introduction

The Vanguard 6435 and 6455 are flexible, RISC processor-based multiservice routers that provide increased performance and enhanced capability through high-speed interfaces for bandwidth-intensive LAN/WAN applications. They offer cost-effective, simultaneous support for voice, fax, video, and mixed protocol data traffic over IP, Frame Relay, X.25, ISDN, ATM or NX64 T1/E1 services. The Vanguard 6435 comes in a compact standalone version, where the Vanguard 6455 can be easily mounted in a 19-inch rack. They are SNMP-manageable and come with a variety of LAN, SNA, and IP networking features.

This section briefly describes the Vanguard 6435 and 6455.

Vanguard 6435 Description

The Vanguard 6435 is a multiservice router for small branch offices that depend on efficiently consolidating serial protocols (such as SNA/SDLC, BSC) with LAN traffic over dedicated or switched services. Fax, RemoteVU video, Voice over Frame Relay and Voice over IP can be combined with data over dedicated or public Frame Relay links and still maintain excellent voice and video quality.

The Vanguard 6435 supports three Vanguard Daughtercard slots for video, voice, fax and mixed protocol data over dedicated or switched services. Two of the slots can be used for Enhanced Vanguard Daughtercards, such as 10/100BaseT (auto-sensing).

Vanguard 6455 Description

The Vanguard 6455 extends the features of the Vanguard 6435 to address the networking needs of medium-to-large branch offices with higher density requirements. It is ideally suited for hierarchical networks where customers need to concentrate remote branch offices using analog or digital leased lines, IP, Frame Relay, ISDN, X.25, and NX64K services.

The Vanguard 6455 provides the following:

- Three Vanguard Daughtercard slots for video, voice, fax and mixed protocol data over dedicated or switched services. Two of the slots can be used for Enhanced Vanguard Daughtercards.
- Two Option Card slots for multi-port interfaces.
- Support for applications that require a number of high-speed interfaces and/or multiple LAN support: 10BaseT, 100BaseT, or Token Ring.
- Support for BSC 3270-to-SNA Conversion. For detailed information refer to the *BSC 3270-to-SNA Manual*, (Part Number T0101-08).
- Support for BSC 2780/3780-to-SNA/LU0 Conversion. For detailed information refer to the *BSC 2780/3780-to-SNA/LU0* Manual, (Part Number T0101-09).

Features

Introduction

This section describes the features available with your Vanguard 6435/6455. For descriptions of the software running on your Vanguard 6435/6455, refer to the appropriate protocol document.

Hardware Features

This table lists the hardware features of the Vanguard 6435 and the Vanguard 6455:

Vanguard 6435	*Vanguard 6455*
Compact, low profile enclosure with fixed motherboard, and support for three daughtercards.	Low profile enclosure with rear accessible motherboard, and support for: • three daughtercards • two Vanguard 6455 Option Cards
Motorola MPC860 PowerPC RISC processor.	Motorola MPC860 PowerPC RISC processor.
4 Megabytes of Non-Volatile FLASH (can be expanded with optional SIMMs) and 16 Megabytes of SDRAM (can be expanded with an optional 32 Megabyte DIMM).	**Before release 5.6** - 4 Megabytes of Non-Volatile FLASH (can be expanded with optional SIMMs) and 16 Megabytes of SDRAM (can be expanded with an optional 32 Megabyte DIMM). **Release 5.6 and greater** - ships with 32 Megabyte DIMM installed.
Standard rear panel ports include: • Two Sync/Async Ports (with DB-25 connectors) • One Ethernet 10BaseT port • Two Async ports (RJ-45 connectors), one acts as the CTP	Standard rear panel ports include: • Two Sync/Async Ports (with DB-25 connectors) • One Ethernet 10BaseT port • Two Async ports (RJ-45 connectors), one acts as the CTP

Increased Flash SIMM Memory Size Expansion

Release 6.2 and greater allows the Vanguard 6435 and 6455 to increase the FLASH memory and expand the CMEM area. Existing Vanguard 6435 and 6455's can be expanded to 12MB FLASH memory as long as the bootprom is also updated. A new bootprom is required to support the 12MB Flash option with the 128 kbyte CMEM. To use 128k CMEM, 8 Mbyte FLASH SIMM must be installed and the bootprom updated. Below are the recommended configurations.

Vanguard 6435:

- SDRAM Expansion 16 Megabyte DIMM standard optional 32 Megabyte.
- 32 Megabyte is recommended when using the 8 Megabyte Flash SIMM.

Vanguard 6455:

- Vanguard 6455: Release 5.6 and greater the Vanguard 6455 ships with the recommended 32 Megabyte DIMM installed.
- Any Vanguard 6455 equipped with 16MB SDRAM and 8MB FLASH SIMM should be upgraded to 32MB SDRAM.

Vanguard 6435	Vanguard 6455
16 Megabytes of SDRAM (can be expanded with an optional 32 Megabyte DIMM).	With release 5.6 and greater the Vanguard 6455 is shipped with 32 Megabyte DIMM installed.
Expanded CMEM area from 64kbytes to 128 kbyte for the 12 MB Flash Option.	Expanded CMEM area from 64kbytes to 128 kbyte for the 12 MB Flash Option.

Below is a table with Flash memory sizes of different Flash SIMM scenarios:

FLASH Memory Size Example

Product Type	FLASH SIMM Scenarios	On Board FLASH Sizes	CMEM Sizes	Maximum Current Image Sizes	Maximum Alternate Image Sizes	Total Flash Sizes
Release 6.2 and greater	None	4M	64K	3.8125 M/ 3997696 bytes	3.8125 M/ 3997696 bytes	4M
	4M	4M	64K	3.8125 M/ 3997696 bytes	3.8125 M/ 3997696 bytes	8M
	8M	4M	128K	5.6875 M/ 5963776 bytes	5.6875M/ 5963776	12M
Prior to Release 6.1	None	4M	64K	3.8125 M/ 3997696 bytes	3.8125 M/ 3997696 bytes	4M
	4M	4M	64K	3.8125 M/ 3997696 bytes	3.8125 M/ 3997696	8M

For additional information about the rear panel ports, the daughtercards, and option cards, refer to appropriate section in Chapter 2, Hardware Description.

For information about the physical specifications of the Vanguard 6435/6455, refer to Appendix A, Specifications.

Optional Cards

You can purchase several types of cards to expand the capability of your Vanguard 6435 and Vanguard 6455. There are three types of cards:

- Vanguard Daughtercards
- Enhanced Vanguard Daughtercards
- Vanguard 6455 Option Cards

Note

Additional cards may be supported with each software release. Check with your Vanguard Managed Solutions representative for the latest list.

Vanguard Daughtercards

These standard Vanguard Daughtercards are currently supported by the Vanguard 6435 and Vanguard 6455:

- 56K DSU/CSU
- DIM (X.21/V.24/V.35/V.36)
- ISDN BRI-U
- ISDN and enhanced ISDN BRI-S/T
- 1-Port Voice (FXS/FXO)
- 2-Port Voice FXS
- Dual E&M
- 4-Port FXS
- 4-Port FXO
- RemoteVU (video)
- FT1/FE1
- V.34 Modem
- V.90 Modem
- G.SHDSL

Note

Release 6.2 or greater software is required for the V.90 modem. Release 6.4 and greater supports the G.SHDSL Daughtercard.

For additional information about these cards, refer to the "Vanguard Daughtercards" section in Chapter 2. For detailed information about installing the Vanguard Daughtercards refer to the Vanguard *Daughtercard Installation Guide* (Part Number T0020).

Enhanced Vanguard Daughtercards

One Enhanced Vanguard Daughtercard is currently supported by the Vanguard 6435 and Vanguard 6455: 10/100BaseT Enhanced Vanguard Daughtercard.

For additional information about this card turn to cards, refer to the "Enhanced Vanguard Daughtercards" section in Chapter 2.

For detailed information about installing the Enhanced Vanguard Daughtercards refer to the "Installing/Removing Enhanced Vanguard Daughtercards" section in Chapter 3.

Option Card (Vanguard 6455 only)

The 6455 supports two option cards:

- SDB 4-port Sync/Async
- Token Ring

For additional information about these Option Cards, refer to "Vanguard 6455 Option Cards" section in Chapter 2.

Software Support

You can obtain Applications Ware Packages that can be tailored to your specific needs. Vanguard Managed Solutions Applications Ware packages are divided into licenses available for Vanguard products. These licenses include the following packages:

- IP+
- SNA+
- Multiservice

For details about the contents of the license upgrade packages and how they can be obtained, refer to the latest *Software Release Notice*.

Note

A license refers to both a legal document that allows you to use features and to the software that contains those features.

Applications

Introduction

This section describes several typical applications for the Vanguard 6435/6455:

- Multimedia Traffic
- IP Traffic
- Virtual Private Network (VPN) From Leased Line to Frame Relay With the Vanguard 6435
- Multiple LAN

Multimedia Traffic

Figure 1-2 shows two Vanguard 6435s linked to a Vanguard 6560 at a main office.

The Vanguard 6435 connects a remote ATM site to a main bank location. The Vanguard 6435 connections are:

- 56K link (through a 56K DSU/CSU daughtercard) to the main bank location.
- ATM async or sync connection (through one of the serial ports or a DIM Site Daughtercard).
- Video camera connection (through a RemoteVU™ Daughtercard).
- Phone connection (through a Single-Port or Dual-Port Voice Daughtercard).

The branch bank site shows how a Vanguard 6435 can handle the connection requirements with these connections:

- 128K link (through the FT1 or FE1 Daughtercard).
- Multiple video cameras (through one or more RemoteVU™ Daughtercards).
- Ethernet LAN connection to the branch bank server.
- Transaction terminal (through one of the built-in serial ports).
- Phone system (using one of the Voice Daughtercards, such as the Dual-Port FXS, or the FT1).
- Cluster controller with attached devices, such as terminals or printers, (through one of the built-in serial ports).

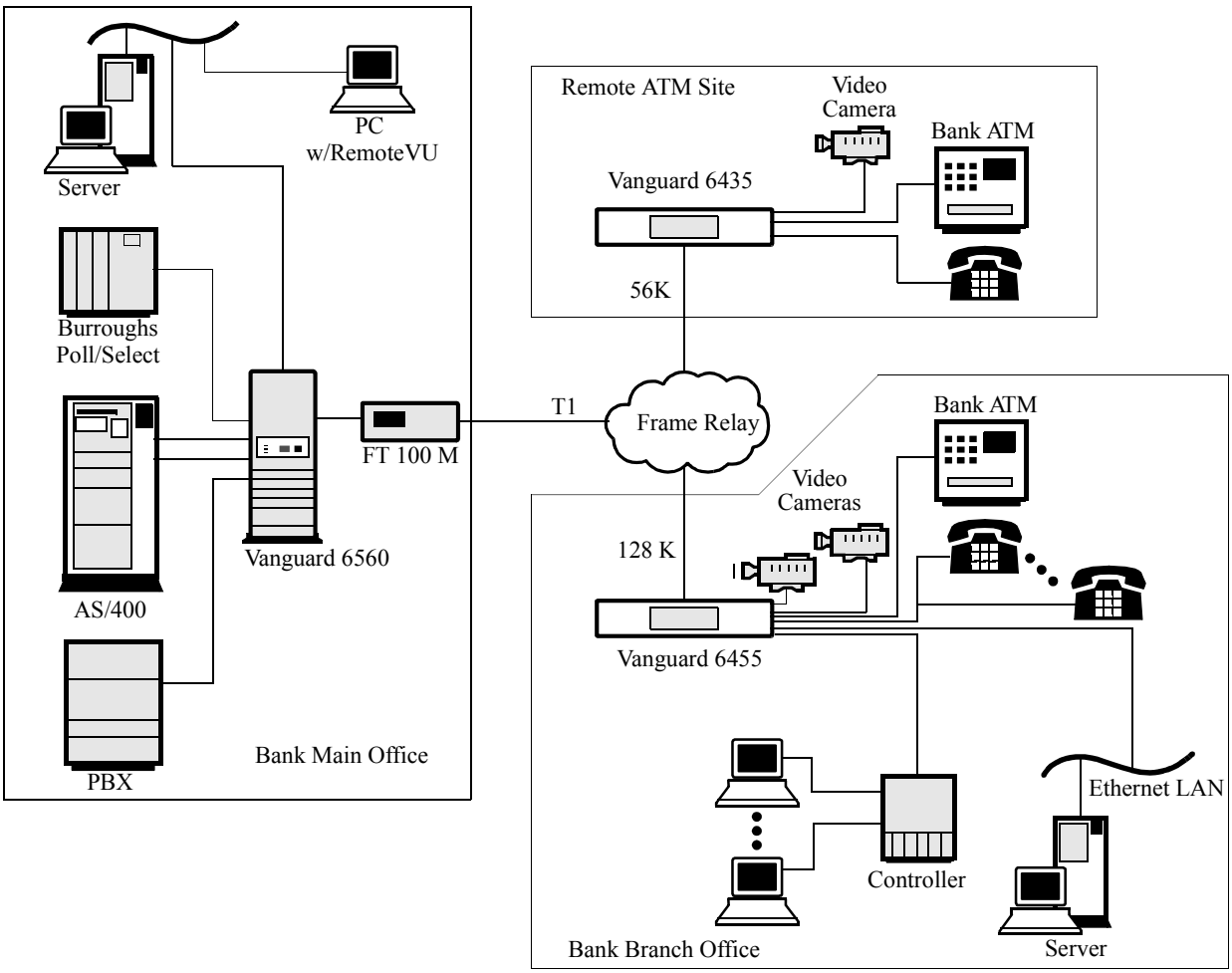


Figure 1-2. Multimedia Traffic Application

IP Traffic

The demand for Internet applications (search engines, browsers, video conferencing, e-commerce) has resulted in explosive growth in the area of client networks. Furthermore, serial and non-IP LAN applications are migrating to IP. This is driven by the success of the Internet. The Vanguard 6435, equipped with the latest software, addresses these needs with IP enhancements such as IP Multicast, RIP2, and Router Proxy.

Figure 1-3 shows a network with a Vanguard 6435 on one end of a link and Vanguard 6560s on the other. IP Traffic is being transported by Frame Relay. The Applications Ware software in the Vanguard nodes (the 6435 and the 6560s) has the capability found in most routers plus the ability of packaging IP traffic in Frame Relay frames. Additionally, the 6435 and the 6560s can back up IP traffic with dial-on-demand or ISDN links.

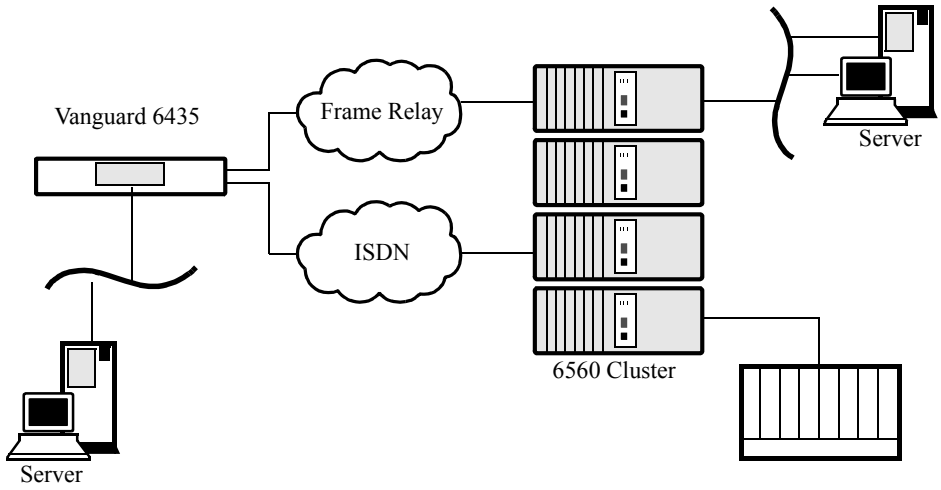


Figure 1-3. IP Traffic Example

Voice over Frame Relay or Voice over IP

The Vanguard 6435 and Vanguard 6455 can support Voice over Frame Relay (VoFR) or Voice over IP (VoIP) as shown in Figure 1-4. In this example, the Vanguard 6435 supports multiple voice lines in the remote branches, which can be set up as extensions on a PBX. These voice connections can be routed over Frame Relay or over IP, or routed over both transmission paths. The Frame Relay link can provide a high-speed connection between branches and the head office for voice and data. The LAN (Ethernet) link connects the Vanguard 6435 with the Internet Service Provider (ISP) to provide the IP link (for a possible company Intranet).

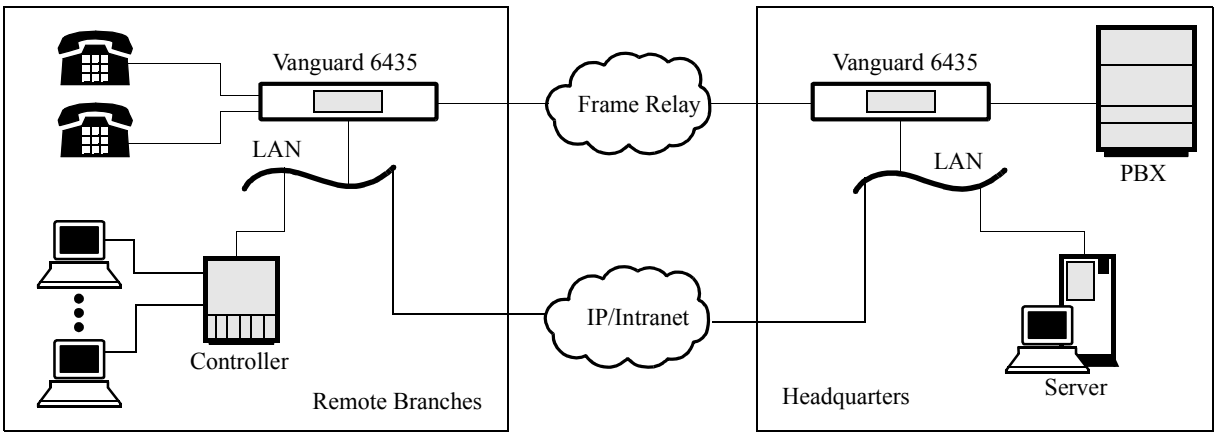


Figure 1-4. Voice over Frame Relay or Voice over IP

Virtual Private Network through Data Encryption

This application example (Figure 1-5) shows how a Virtual Private Network (VPN) can be created by encrypting data before it is transmitted over Frame Relay or X.25 networks. There is no security and privacy for unencrypted data as it moves from one location to another through the public network. After encryption, the Vanguard 6435 offers secure transmission of data over any shared public medium, creating a virtual private network.

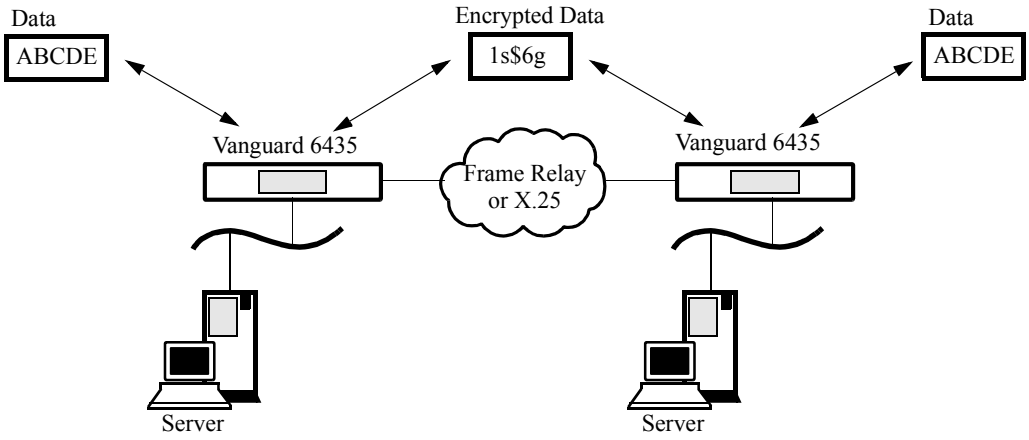


Figure 1-5. Virtual Private Network through Encryption

Multiple LANs

The Vanguard 6435 and 6455 provide multiple LAN support for customers that need to segment their LAN traffic. In the example in Figure 1-6, the customer has chosen to separate point-of-sale traffic from PC applications. Other customers choose to use the second LAN port for redundancy.

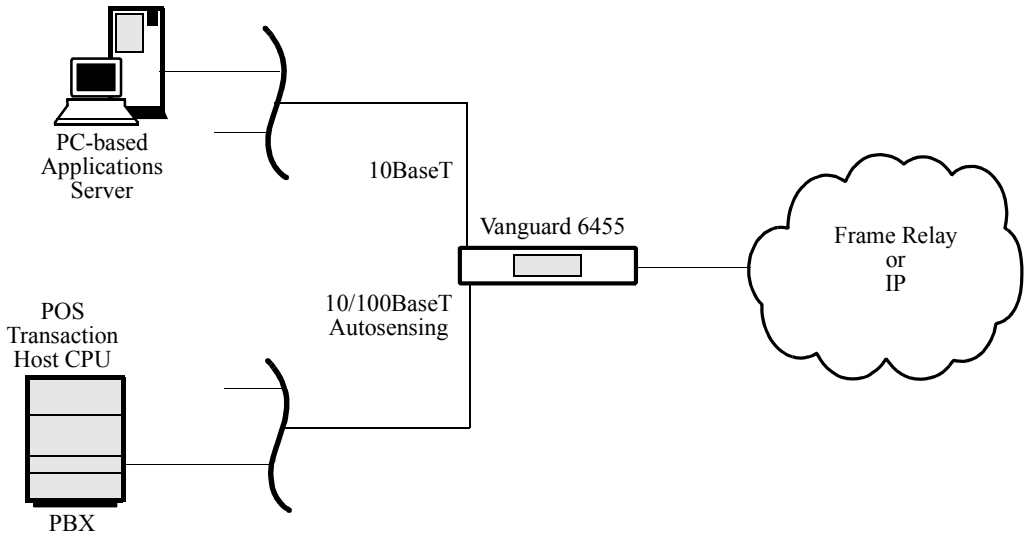


Figure 1-6. Multiple LAN Example

PRI Supplementary Service

Introduction

The PRI Supplementary Services provide transparent support for supplementary PBX services, so that proprietary PBX features are not lost when connecting PBX's through the Vanguard Managed Solutions Vanguard gateway networks. Examples of these features are:

- Calling Line Identification Presentation (CLIP)
- Calling Line Identification Restriction (CLIR) in temporary mode
- Call Holding
- Call Transfer
- Call Forwarding
- Call Waiting

Note

Release 6.0 and greater includes end-to-end support for Q.Sig supplementary services for the 6455 and 7300 Series platforms. This capability is consistent with the services now available for BRI on these same platforms.

Messaging

Figure 1-7 through Figure 1-10 represent the four types of messaging supported:

- Basic Q.SIG Application
- Facilities Messages
- Connectionless Messages
- D-Channel Only Messages

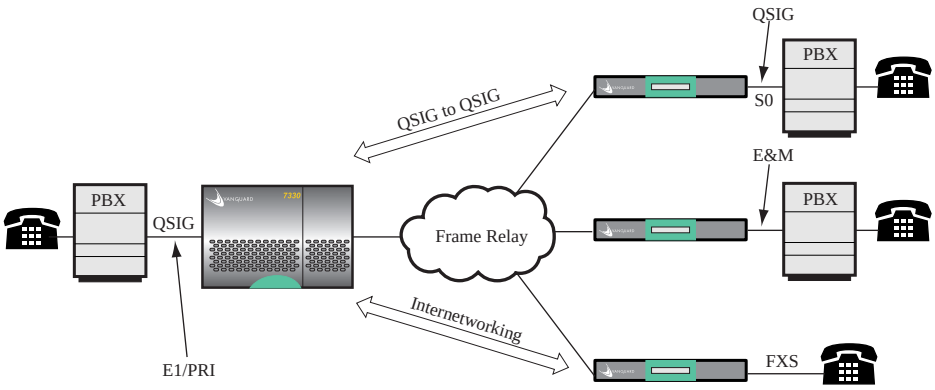


Figure 1-7. Basic Q.SIG Application

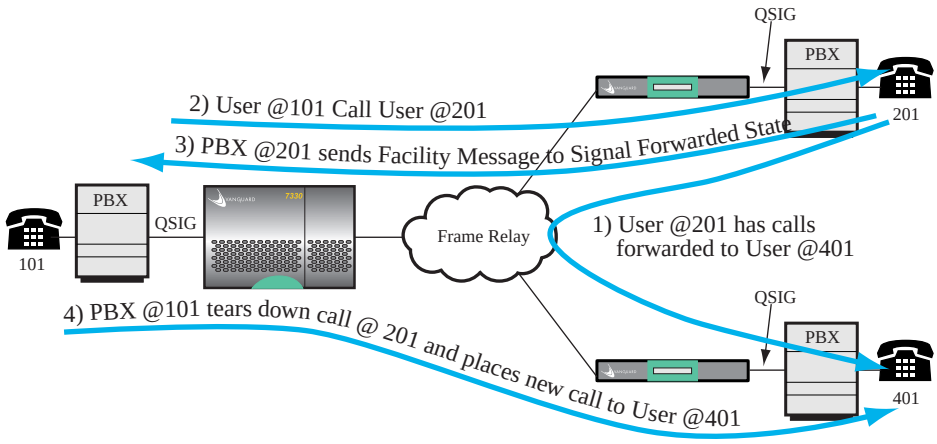


Figure 1-8. Facilities Messages

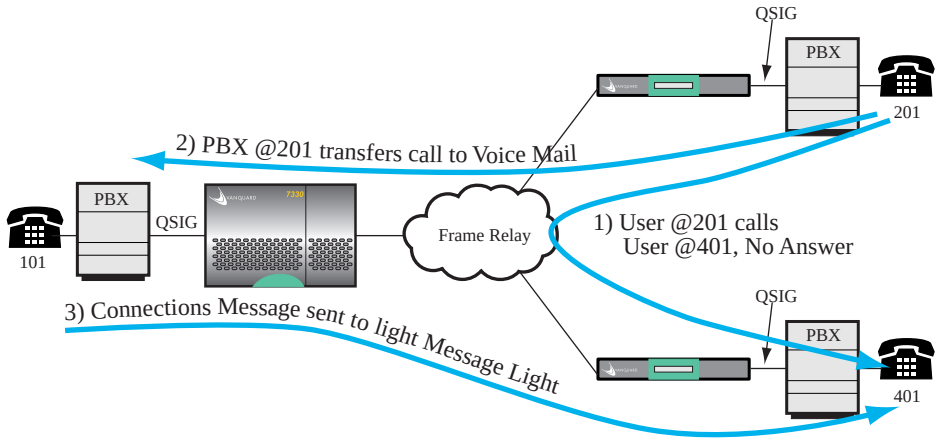
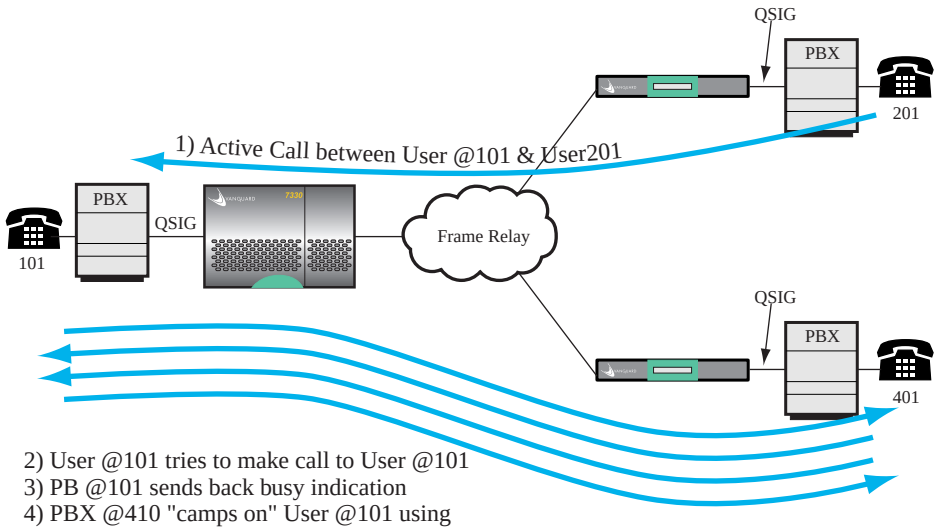


Figure 1-9. Connectionless Message



2) User @101 tries to make call to User @101
3) PB @101 sends back busy indication
4) PBX @410 "camps on" User @101 using
"D" Channel Only Messages
5) PBX @401 places call when User @101 is free

Figure 1-10. D-Channel Only Messages

Vanguard 6455 Requirements for Bisync

Vanguard 6455 Requirements

The guidelines below are required when using the BSC 3270-to-SNA Conversion feature:

- 32 Meg SIMM Memory Module
- Local Dynamic Port Creation Heap Size needs to be configured for Bisync and AS/400

Note

When setting the Local Dynamic Port Creation Heap Size, refer to the Ease of Configuration information located in the following section. A copy of your current configuration files should be saved before changing the Local Dynamic Port Create Heap Size.

BSC 3270-to-SNA Conversion Increase Parameters to Maximum Value

The following Node Record Parameters need to be increased in order to accommodate increasing the number of SNA to Bisync 3270 Devices to 256:

- Mnemonic Table Size
- Quantity of DSP Devices
- Maximum Simultaneous Calls

The Frame Relay Station or X.25 Port parameter; Number of Two Way Simultaneous Calls, needs to be increased in order to accommodate increasing the number of SNA to Bisync 3270 Devices to 256. Maximum number of SLAC Stations supported for BSC/LU Devices on a Vanguard 6455 is 20.

BSC 2780/3780-to-SNA/LU0 Conversion Increase Parameters to Maximum Value

The following Node Record Parameters need to be increased in order to accommodate increasing the number of SNA 3780 remote ports to 256:

- Mnemonic Table Size
- Quantity of SES 3780 remote ports
- Maximum Simultaneous Calls

The Frame Relay Station or X.25 Port parameter; Number of Two Way Simultaneous Calls, needs to be increased in order to accommodate increasing the number of 3780 conversion stations to 256.

Enable Ease of Configuration

Introduction

This section explains how to configure and set up your Vanguard device for Ease of Configuration.

Device Memory

Ease of Configuration is a memory intensive function. Therefore, be sure that your node has the maximum amount of RAM it can handle. For information about memory capacity, refer to the installation guide that came with your device.

Parameters

To enable Ease of Configuration, you need to configure two Node Record parameters and then boot the node.

For Ease of Configuration, these parameters should be set to their maximum value.

The parameters are described below:

Note

These parameters are also described in the Configure the Node chapter of the *Vanguard Basic Configuration Manual* (Part Number T0113).

*Shared Dynamic Port Creation Heap Size

Range:	0 to 16000000
Default:	0
Description:	This specifies the size of the special shared memory pool dedicated for Ease of Configuration. • To disable this parameter set to zero (0). • To enable Ease of Configuration, set this parameter to the maximum value. **Note** A change to this parameter requires a node boot to take effect.

*Local Dynamic Port Creation Heap Size

Range:	0 to 16000000
Default:	0
Description:	This specifies the size of the special local memory pool dedicated for Ease of Configuration. • To disable this parameter set to zero (0). • To enable Ease of Configuration, set this parameter to the maximum value. **Note** A change to this parameter requires a node boot to take effect.

Configuring the Parameters

This table explains how to configure the two parameters:

Step	Action
1	From the Main menu, select **Configure**.
2	From the Configure menu, select **Node**.
3	Press **ENTER** until the parameter ***SHARED Dynamic Port Creation Heap Size** appears. Enter the maximum value (**16000000**).
4	Press **ENTER** again. The parameter ***LOCAL Dynamic Port Creation Heap Size** appears. Type the maximum value (**16000000**).
5	Press **;** (semi-colon) and then press **ENTER**.
6	Perform a Node Boot (Warm). The node reboots and the Ease of Configuration function is enabled.

After you complete this procedure, review the alarm log for disabled ports. If necessary, reduce the resource requirements allocated to the other ports and stations and repeat the above procedure.

Chapter 2
Hardware Description

Overview

Introduction

This chapter describes the Vanguard 6435 and Vanguard 6455 and the hardware components that make up the devices.

- Vanguard 6435/6455 enclosures and standard hardware components
- Daughtercards
- Enhanced Daughtercards
- Option Cards (Vanguard 6455 only)

Enclosure

Introduction

This section describes the following:

- Vanguard 6435/6455 enclosures
- Motherboard
- Front panel
- Rear panel

Enclosure

The Vanguard 6455 fits into a low profile enclosure that can be used on a desktop or mounted into a standard 19-inch equipment rack. The Vanguard 6455 enclosure contains a 110/220 Vac power supply with the power switch and receptacle on the rear panel.

The Vanguard 6435 fits into a compact, low profile enclosure case, designed for desktop or shelf installation. Its enclosure consists of two pieces:

- Lower base section with vent openings.
- Top cover section which is attached to the lower base section.

The enclosures contains a motherboard and (optional) daughtercards. With the Vanguard 6450, the enclosure can also hold up to two (optional) option cards.

Front Panel

Figure 2-1 shows Vanguard 6435 and Vanguard 6455 front panels.

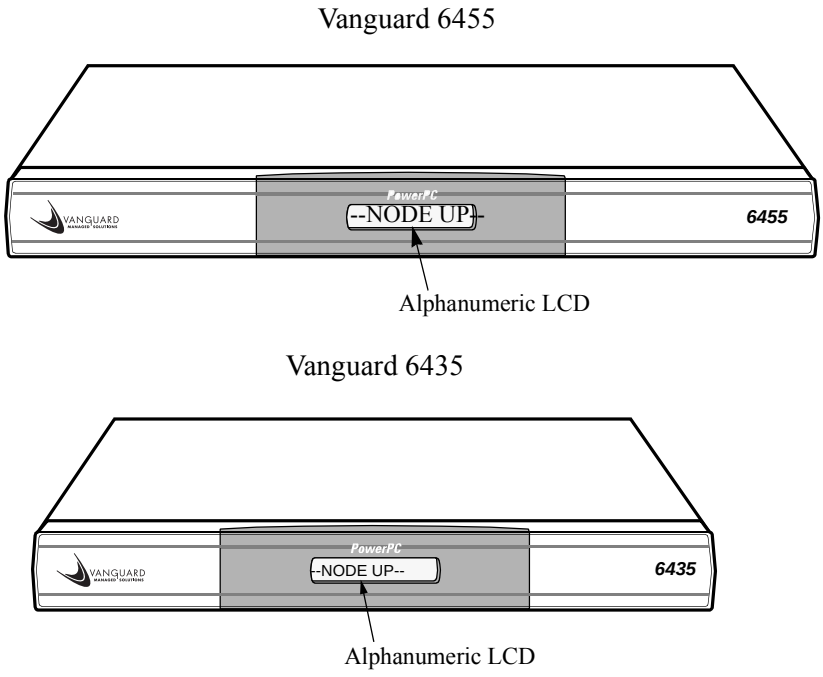


Figure 2-1. Vanguard 6435/6455 Front Panels

The front panel display has a 16-character LCD display which provides Vanguard 6435/6455 status messages. These are especially useful during the power-up sequence when software loading and booting messages appear. For a full description of all display messages, refer to the "Front Panel Display Messages" section in Chapter 4.

Rear Panel

Figure 2-2 shows a Vanguard 6455 rear panel and Figure 2-3 shows a Vanguard 6435 rear panel. The rear panel contain following:

- Two Sync/Async DIM ports (DB-25 connectors)
- Two Async ports (RJ-45 connector), one acts as the CTP
- One Ethernet port (with 10BaseT connector)
- Power Switch and Receptacle

The figure also shows locations for five optional cards:

- Three for Vanguard Daughtercards (Enhanced Vanguard Daughtercards can fit into only the right two daughtercard slots.)
- Two for option cards (Vanguard 6455 only)

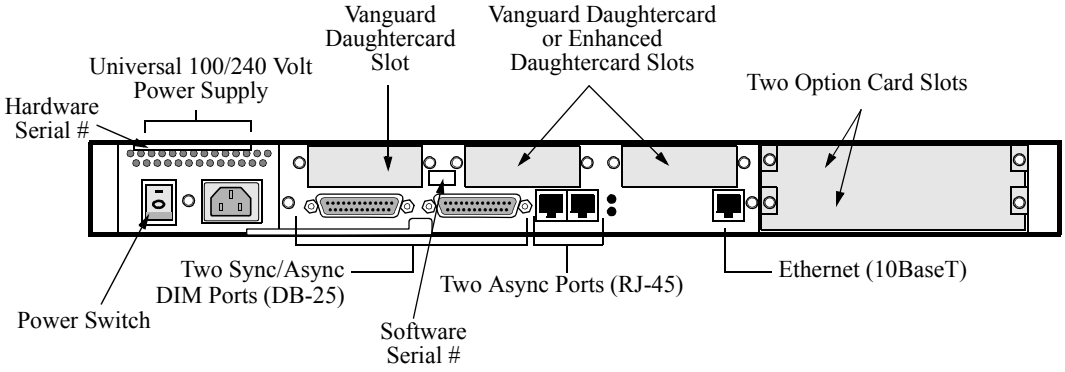


Figure 2-2. Vanguard 6455 Rear Panel

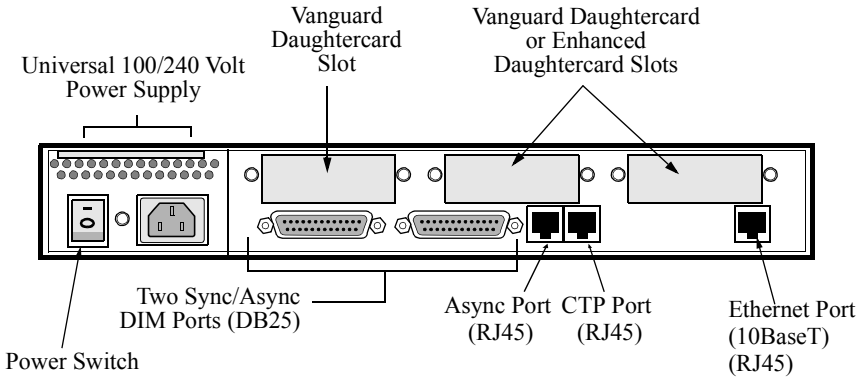


Figure 2-3. Vanguard 6435 Rear Panel

Figure 2-4 shows the port number on the Vanguard 6455 rear panel and Figure 2-5 shows the port numbers on the Vanguard 6435 rear panel.

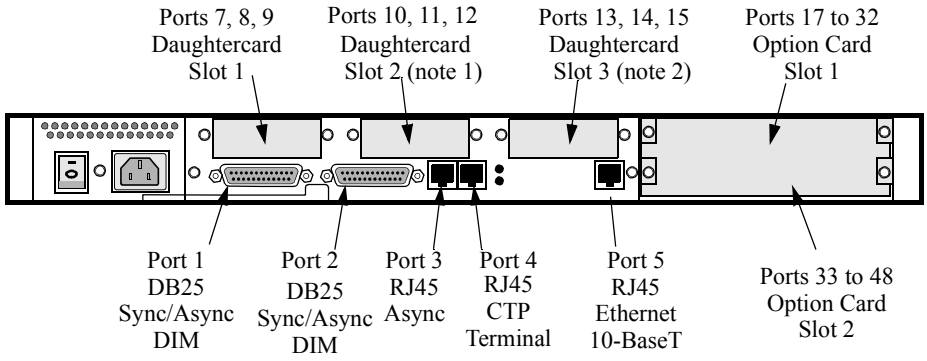


Figure 2-4. Vanguard 6455 Rear Panel Port Numbers

Note

Observe these notices (referenced in Figure 2-4 and 2-5) when identifying Ports and slot number on your Vanguard 6435 or Vanguard 6455:

Note 1:When an Enhanced Daughtercard is installed in the second daughtercard slot on the Vanguard 6435/6455 this slot is referred to as Slot 1 meaning Enhanced Daughtercard Slot #1.

Note 2: When an Enhanced Daughtercard is installed in the second daughtercard slot on the Vanguard 6435/6455 this slot is referred to as Slot 2 meaning Enhanced Daughtercard Slot #2.

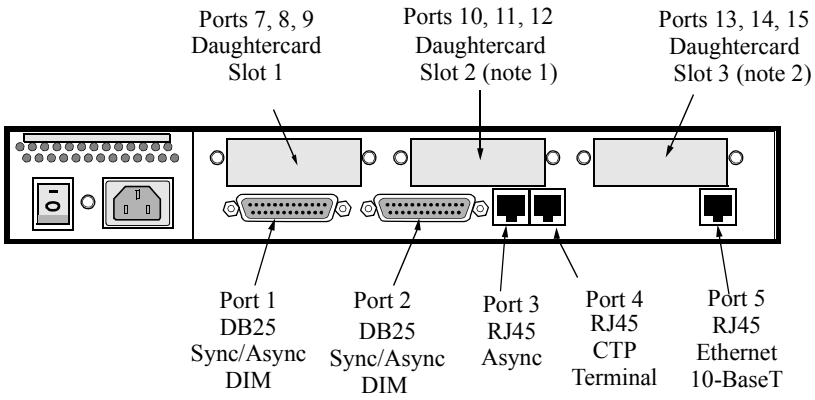


Figure 2-5. Vanguard 6435 Rear Panel Port Numbers

Note

For information about port numbering and cabling, refer to the "Cabling Your Vanguard 6435/6455" section in Chapter 3.

Caution

Do not connect the Ports 3, 4, or 5 to the Public Communications Network.

Serial Numbers

There are two serial numbers on the Vanguard 6455 rear panel (see Figures 2-2 and 2-3):

- Software Serial Number: Indicates the version of software running in your unit.
- Hardware Serial Number: Indicates the version of hardware in your unit.

Refer to these serial numbers when contacting your Vanguard Managed Solutions Service Representatives.

Note

On the Vanguard 6435, the serial numbers are underneath the unit.

Motherboard

General Description

The Vanguard 6435 motherboard contains 4 Mbytes FLASH and has 16 Mbytes of SDRAM (synchronous DRAM) on an attached DIMM (expandable to 32 Mbytes of SDRAM). The Vanguard 6455 has 32 Mbytes of SDRAM.

The motherboard has connectors for:

- FLASH expansion: 4 Mbyte SIMM
- Vanguard 6435 - SDRAM Expansion: 16 Mbyte DIMM standard, 32 Mbyte optional. When using 8Mbyte flash, 32 Mbyte is recommended.
- Vanguard 6455- 32 Mbyte recommended
- Data Compression/Encryption SIMM
- Two DIMS
- Three Vanguard Daughtercards
- Two Enhanced Vanguard Daughtercards

There are three DIP switches:

- Two DIM DIP switches
- One Test Mode switch

There is a battery which provides power for the unit's real time clock.

Figure 2-6 shows the location of the motherboard components.

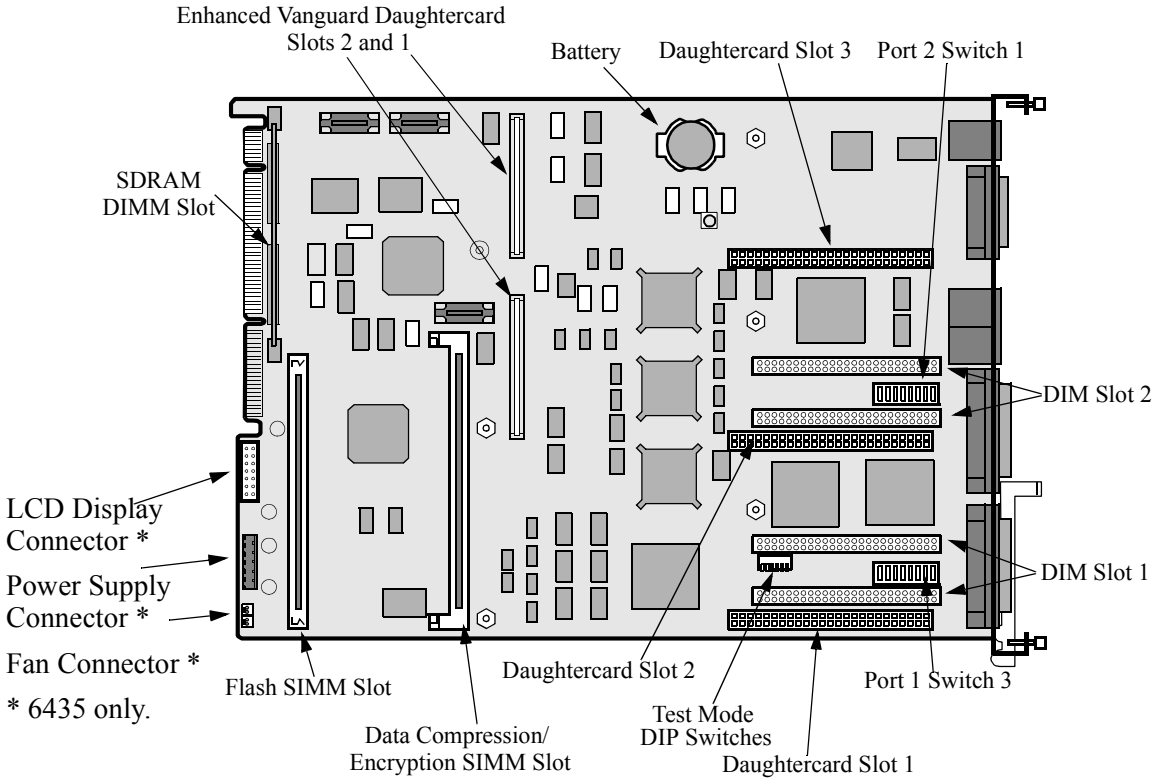


Figure 2-6. Vanguard 6435/6455 Motherboard

Access the Motherboard

To access the motherboard components you must remove the motherboard from the enclosure.

- For information about removing and installing the motherboard refer to the "Accessing the Motherboard" section in Chapter 3.
- For information about removing or installing motherboard components, refer to the "Modifying Your Vanguard 6435/6455" section in Chapter 3.

Daughtercards

The Vanguard 6435/6455 can support up to three of these standard Vanguard Daughtercards:

- 56K DSU/CSU
- DIM (V.11/V.24/V.35/V.36)
- ISDN BRI-U
- ISDN BRI-S/T & enhanced ISDN BRI S/T
- 1-Port Voice (FXS/FXO)
- 2-Port Voice FXS
- 4-Port Voice FXS
- 4-Port Voice FXO
- Dual E&M
- RemoteVU (video)
- FT1/FE1 Daughtercards
- V.34 Modem
- V.90 Modem
- G.SHDSL

Note

Release 6.2 or greater software is required for the V.90, release 6.3 and greater supports the enhanced ISDN BRI S/T and release 6.4 and greater supports the G.SHDSL Daughtercard.

The Vanguard 6435/6455 can support two Enhanced Vanguard Daughtercards, two 10/100BaseT cards, two ATM Enhanced Vanguard Daughtercards or one of each.

These daughtercards are described in the "Vanguard Daughtercards" on page 2-11 and the "Enhanced Vanguard Daughtercards" on page 2-19.

DIMs

The Vanguard 6435/6455 supports V.11, V24, V.35, V.36, and DSU DIMs.

The two DIM slots are associated with specific ports:

- DIM Slot 1 is associated with Port 1.
- DIM Slot 2 is associated with Port 2.

Depending on how the DIMs are placed, the ports act as DTE or DCE. For more information, refer to the "DIMs, SIMMs, DIMMs and Switches" section in Chapter 3.

DIM DIP Switches

Depending on the type of DIM on the motherboard, the DIP switches can have either of two settings as shown in Figure 2-7. These switches are set at the factory. If you need to change the DIP switch settings, refer to "DIMs, SIMMs, DIMMs and Switches" section in Chapter 3.

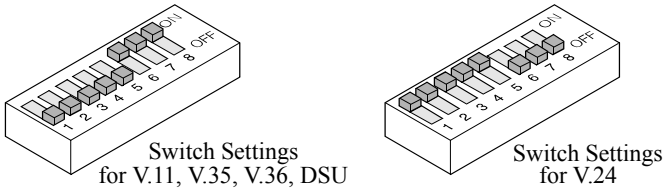


Figure 2-7. Settings for DIM DIP Switches

This table details the DIM DIP switch settings:

Switch Number	*V.11, V.35, V.36, DSU*	*V.24*
1	Off	On
2	Off	On
3	Off	On
4	Off	On
5	Off	On
6	On	Off
7	On	Off
8	On	Off

Test Mode Switch

Figure 2-8 shows the Test Mode switch and this table explains the function of each switch setting.

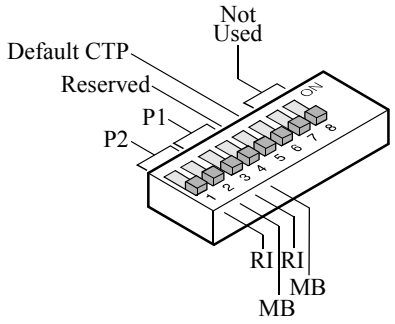


Figure 2-8. Test Mode Switch

Switch No./Name	On	Off
1: Port 2 RI/TM	Pin 22 is input on Port 2	Pin 22 is output on Port 2
2: Port 2 MB	Pin 25 is input on Port 2	Pin 25 is output on Port 2
3: Port 1RI/TM	Pin 22 is input on Port 1	Pin 22 is output on Port 1
4: Port 1MB	Pin 25 is input on Port 1	Pin 25 is output on Port 1
5: Reserved	—	—
6: Default CTP	—	Off: Port 4 becomes 9600/ 8/N, APAD, or ATPAD
7	Not Used	
8	Not Used	

SIMMs

The motherboard has two slots for SIMMs:

- FLASH: This connector takes a FLASH SIMM to increase the node's FLASH memory.
- Data Compression/Encryption: Set on its side, this connector take a SIMM to provide data compression capabilities or a SIMM to provide encryption.

Caution

Be sure to place the FLASH, Data Compression, and Encryption SIMMs in the correct slot. The SIMM Slots are physically identical. If you place the SIMM in the wrong slot, the equipment can be damaged.

For information on installing or removing SIMMS, refer to the "DIMs, SIMMs, DIMMs and Switches" section in Chapter 3.

DIMM

The motherboard has a slot for a single SDRAM DIMM. The Vanguard 6435 comes standard with a 16 Mbytes SDRAM DIMM. An option 32 Mbyte SDRAM DIMM is also available. Below are the recommended configurations.

Vanguard 6435:

- SDRAM Expansion 16 Megabyte DIMM standard optional 32 Megabyte.
- 32 Megabyte is recommended when using the 8 Megabyte Flash SIMM.

Vanguard 6455:

- Vanguard 6455: Release 5.6 and greater the Vanguard 6455 ships with the recommended 32 Megabyte DIMM installed.
- Any Vanguard 6455 equipped with 16MB SDRAM and 8MB FLASH SIMM should be upgraded to 32MB SDRAM. 32Mbyte.

Warning

Your Vanguard product was designed and certified for use with specific memory option SIMMs. It is IMPORTANT that you install only the devices that are certified for use with your Vanguard product. Installation of an incorrect FLASH SIMM module could result in damage to the SIMM device or your Vanguard Product. Please see the list below for the memory device that is compatible with your hardware platform.

Vanguard 6400 Compatible FLASH SIMM Devices are as follows:

4-Meg FLASH Devices
PN - "EDI7F292MC100BNC"
PN - "SM70848XA2JIES2"

8-Meg FLASH Devices
PN - "IW388X1-R-120"
PN - "EDI7F492MC120BNC"

The FLASH SIMM Device Part Number (PN) can be found in small print on the face of the SIMM device. For further assistance, please call VanguardMS Service.

Vanguard Daughtercards

Introduction

The Vanguard 6455 and 6435 can support these standard Vanguard Daughtercards:

- DIM (X.21/V.24/V.35/V.36) Daughtercard
- 56K DSU/CSU Daughtercard
- ISDN BRI-U Daughtercard
- ISDN & enhanced ISDN BRI S/T Daughtercards
- ISDN BRI Voice Daughtercard
- RemoteVU (video) Daughtercard
- 1-Port Voice Daughtercard (FXS/FXO)
- 2-Port Voice FXS Daughtercard
- 4-Port Voice FXS Daughtercard
- 4-Port Voice FXO Daughtercard
- Dual E&M Daughtercard
- FT1/FE1 Daughtercards
- V.34 Modem
- V.90 Modem
- G.SHDSL

This section briefly describes these cards.

For instructions for installing these cards, refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020).

Note

For information regarding Enhanced Vanguard Daughtercards, turn to the "Enhanced Vanguard Daughtercards" on page 2-19.

Daughtercard Compatibility

Older Vanguard Daughtercards do not fit into the Vanguard 6435/6455. You can only use the newer daughtercards which are identified by a dimple as shown in Figure 2-9. If the dimple is not present, do not attempt to use the Daughtercard in the Vanguard 6435/6455.

Also, when installing a Vanguard Daughtercard into a 6435/6455, you must use the shorter two-sided header. The taller header is used with other Vanguard units.

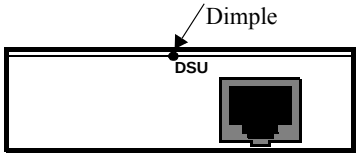


Figure 2-9. New Vanguard 6435/6455 Daughtercard Example

Caution

If you attempt to force an older Vanguard Daughtercard into a Vanguard 6435/6455, the equipment will be damaged.

If you have an older Vanguard Daughtercard and would like to use it in a Vanguard 6435/6455, contact your service representative about having the card reworked.

DIM Daughtercard

This card supports a single V.11, V.24, V.35, or V.36 DIM (Digital Interface Module) and can be set as either a DTE or DCE.

Figure 2-10 shows the DIM Daughtercard connector as it appears on the back panel.

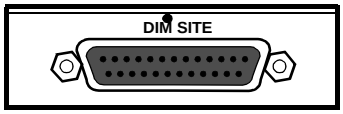


Figure 2-10. DIM Daughtercard Connector

56 K DSU/CSU Daughtercard

The DSU Daughtercard provides an RJ48S connector and can support speeds of 56 kbps (synchronous). It conforms to AT&T 62310 point-to-point and multipoint, and to ANSI T1/E1.4/91-006 56 kbps. The card supports the following capabilities:

- Internal/external clocking
- Internal/external loopback
- 4-wire line driver operation

The card also supports multidrop DSUs when either of these conditions exist:

- If a MARK Idle protocol is used (such as MX25).
- If the Telco uses an OR'ed or Data Contention is used to mix individual DRU drops.

Figure 2-11 shows the 56K DSU/CSU Daughtercard connector as it appears on the back panel.

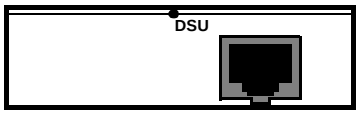


Figure 2-11. 56K DSU/CSU Daughtercard Connector

ISDN BRI-U Daughtercard

This card provides 2B+D Channel through an ISDN BRI U interface. It conforms to ANSI T1.601 1992 (2B1Q), is LAPD:ITU Q.921 compliant, and supports the following:

- Integral X.31
- Q.931 dial support
- NI1, 5ESS, DMS-100 switch types
- D Channel Packet Mode
- Leased Circuit Services (I Interface)
- Japan High-Speed Digital

Figure 2-12 shows the ISDN BRI-U Daughtercard connector as it appears on the back panel.

Figure 2-12. ISDN BRI-U Daughtercard Connector

ISDN & enhanced ISDN BRI-S/T Daughtercard

This card provides 2B+D Channel through a BRI S/T interface. It conforms to ITU I.430, is LAPD:ITU Q.921 compliant, and supports:

- Integral X.31
- Q.931 dial support
- NI1, 5ESS, DMS-100, ETSI, Euro Numeris switch types
- D Channel Packet Mode
- Leased Circuit Services (I Interface)
- Permanent B for German Monopol support or Japan High-Speed Digital

Figure 2-13 shows the ISDN BRI-S/T Daughtercard connectors as they appear on the back panel.

Figure 2-13. ISDN & enhanced BRI-S/T Daughtercard Connectors

Note

Termination options for the Release 6.3 and greater enhanced ISDN BRI ST data Daughtercards are set in the Configure menu, and are not controlled by switches. For more information, refer to the *Vanguard Integrated Services Digital Network: ISDN Manual* (Part Number T0103-06).

ISDN BRI Voice Daughtercard

This card provides 2B+D Channel through a BRI S/T interface. It conforms to ITU I.430, is LAPD:ITU Q.921 compliant, and supports:

- Integral X.31
- ITU-T Q.931 (EURO IDSN) - ETSI switch type to connect to PBXs and public networks.
- ECMA 143 - QSIG Basic Service to connect to PBXs over private line.
- ECMA 165 - QSIG Generic Functions for Support of PBX Supplementary Services.
- ITU-T G.711A (A-law) and G.711U (μ-law) interface voice encoding.
- ITU-T G.723, G729, and Vanguard Managed Solutions proprietary CVSELP packet voice compression.

Figure 2-14 shows the ISDN BRI Voice Daughtercard connectors as they appear on the back panel.

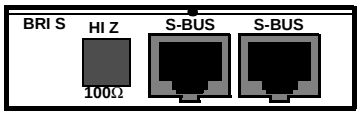


Figure 2-14. ISDN BRI Voice Daughtercard Connectors

RemoteVU (Video) Daughtercard

The RemoteVU Daughtercard provides complete end-to-end solution for the transport of video images over low bandwidths (as low as 2.4 kbps). It is ideal for applications such as security surveillance and remote monitoring.

The daughtercard has three ports:

- RJ-45 connector: for camera controls (such as pan-tilt-zoom).
- BNC connector: the primary video input from a single camera.
- 8 Pin Mini-DIN: connects to a custom cable that terminates in three BNC connectors.

When its video ports are connected to a video multiplexor, the RemoteVU Daughtercard can support up to 64 cameras. The daughtercard converts analog video to digital, scales size, and compresses and transports the data. In addition to supporting live video streams, the daughtercard has a one-minute history buffer for capturing video before the connection is established.

Figure 2-15 shows the RemoteVU Daughtercard connectors as they appear on the back panel.

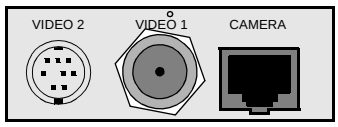


Figure 2-15. Remote VU Daughtercard Connectors

1-Port FXS/FXO Voice Daughtercard

The 1-Port Voice FXS/FXO Daughtercard provides RJ11 connectors for FXS and FXO Ports. However, only one port can be active at a time.

Figure 2-16 shows the FXS/FXO Voice Daughtercard connectors as they appear on the back panel.

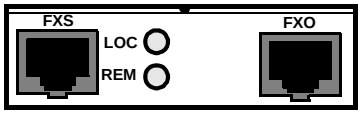


Figure 2-16. 1 port FXS/FXO Voice Daughtercard Connectors

2-Port Voice FXS Daughtercard

The 2-Port Voice FXS Daughtercard has two RJ11 connectors for two FXS Ports. The two ports can be used simultaneously and each port supports one voice channel.

Figure 2-17 shows the 2 Port Voice FXS Daughtercard connectors as they appear on the back panel.

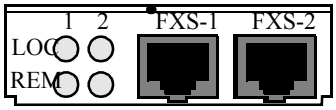


Figure 2-17. 2-Port Voice FXS Daughtercard Connectors

Note

Calls between two FXS ports within the same Vanguard 6435/6455 are not supported.

4-Port Voice FXS Daughtercard

The Vanguard Quad FXS Daughter Card is supported on the Vanguard 6435 and 6455. The 4-Port Voice FXS Daughtercard has four RJ11 connectors for four FXS Ports.The new software for this card is in release 6.0.

Figure 2-18 shows the 4-Port Voice FXS Daughtercard connectors as they appear on the back panel. Figure 2-19 shows the top view of an FXS Daughter Card.

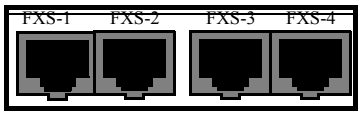


Figure 2-18. FXS Daughtercard

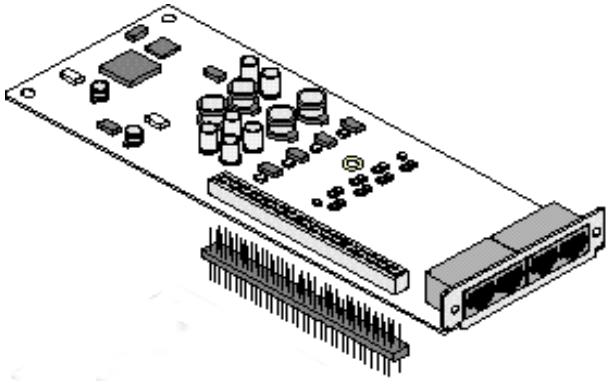


Figure 2-19. Overview of FXS Daughtercard

4-Port Voice FXO Daughtercard

The Vanguard Quad FXO Daughter Card is supported on the Vanguard 6435 and 6455. The 4-Port Voice FXO Daughtercard has four RJ11 connectors for four FXO Ports.The new software for this card is in release 6.0.

Figure 2-20 shows the 4-Port Voice FXO Daughtercard connectors as they appear on the back panel. Figure 2-21 shows the top view of an FXO Daughter Card.

Figure 2-20. FXO Daughtercard

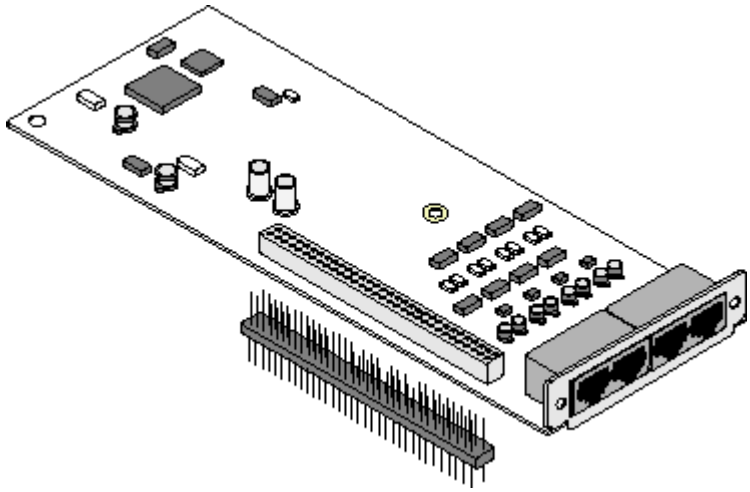


Figure 2-21. Overview of FXO Daughtercard

FT1/FE1 Daughtercards

The FT1/FE1 Daughtercards allow a Vanguard 6435/6455 to transfer data over a T1 or E1 network. The daughtercards support full and fractional T1 or E1 speeds.

- The FE1 Daughtercard provides line rates 2.048 Mbps and data rates of n x 64 kbps (where n is 1 to 31) per channel.
- The FT1 Daughtercard provides line rates 1.544 Mbps and data rates of n x 56 kbps (where n is 1 to 24) per channel.

Figure 2-22 shows the FT1 and the FE1 Daughtercard connectors as they appear on the back panels. The FT1 Daughtercard has a single RJ48C connector while the FE1 Daughtercard has two BNC connectors along with one RJ48C connector.

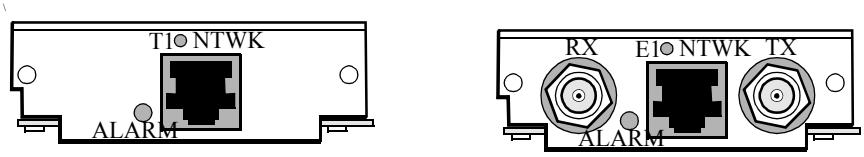


Figure 2-22. FT1 and FE1 Daughtercard Connectors

Note

The FE1 Daughtercard comes with this label which specifies that the E1 interface complies with the Australian requirements ACA TS 016 - 1997 for connection to E1 SELV services. Also the E1 interface meets the IEC950 specifications for TNV1.

Channelized Data is not Supported for Ports 7, 10 or 13

Although the "Channelized" and "ISDN-PRI" data features are configurable under the "Format Type" parameter for T1/E1 daughter cards on the Vanguard 6435/55 products, these features are not supported, and their use can result in unpredictable behavior.

Do not configure "Format Type" to "Channelized" or "ISDN-PRI". Set the default "Format Type" parameter to "Fractional".

Dual E&M Daughtercard

The Dual E&M Daughtercard has two E&M interfaces. The ports use RJ11 connectors.

Figure 2-23 shows the Dual E&M Daughtercard connectors as they appear on the back panel.

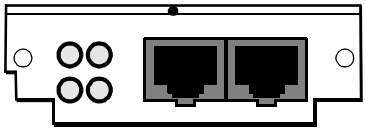


Figure 2-23. Dual E&M Daughtercard Connectors

V.34 Modem Daughtercard

The V.34 modem daughtercard is essentially a 3460 modem that can be installed in a Vanguard 6435 or Vanguard 6450. Once the card is in your unit, it performs as if it were an external modem. For information about configuring and using the V.34 modem, refer to the *3460 Fast'R User's Guide* (Part Number T0022-01).

Figure 2-24 shows the rear panel connectors on the V.34 modem daughtercard.

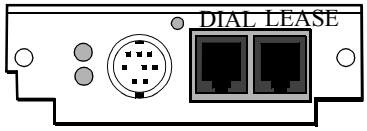


Figure 2-24. V.34 Modem Daughtercard Connectors

V.90 Modem Daughtercard

The V.90 modem daughtercard provides dial back-up for a customers PPP Async applications. The V.90 uses a dual RJ-11 for connection to central offices, PBXs or telephone systems. V.90 is designed for the Vanguard 6435 and 6455. The Vanguard V.90 daughtercard requires release 6.2 or greater software.

Figure 2-25 shows the rear panel connectors on the V.90 modem daughtercard. For installation instructions, refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020).

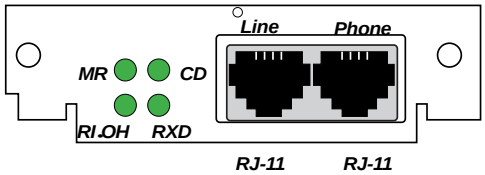


Figure 2-25. V.90 Modem Daughtercard Connectors

G.SHDSL

The G.SHDSL Daughtercard is available for the Vanguard 6435 and 6455 with Release 6.4 and greater software. Two G.SHDSL Daughtercards are supported simultaneously in any of the three daughtercard slots.

Warning

A ferrite bead is required on a Vanguard 6435 and 6455. A ferrite bead filters out line disturbances, on audio and power cables. Installation of a bead is required to ensure compliance with the European Union (EU) EMC Directive 89/336/EEC and compliance with FCC Part 15, Class A. Failure to install the ferrite component will result in non-compliance with the EU EMC Directive and may cause interference with other electrical equipment.

Figure 2-26 shows the rear panel connector on the G.SHDSL Daughtercard. For information on the G.SHDSL Daughtercard reference the *G.SHDSL Manual* (Part Number T0100-14). Daughtercard and Ferrite Bead Installation instructions are available in the *Daughtercard Installation Guide* (Part Number T0020).

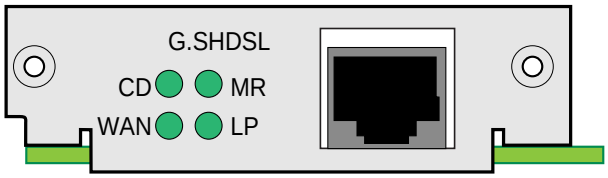


Figure 2-26. G.SHDSL Daughtercard Connector

Enhanced Vanguard Daughtercards

Introduction

This section describes the Enhanced Vanguard Daughtercards currently supported by the 6435 and 6455. These include:

- "10/100BaseT Enhanced Daughtercard" on page 2-20
- "ATM Enhanced Daughtercard" on page 2-22

10/100BaseT Enhanced Daughtercard

Introduction

The 10/100BaseT Enhanced Vanguard Daughtercard conforms to the Fast Ethernet specification (IEEE 802.3u) known as 100BaseT. This LAN standard has raised the Ethernet speed limit from 10 Megabits to 100 Megabits per second. Furthermore, the card has an auto-sensing feature that allows it to determine if the connection is 10BaseT or 100BaseT and adjust its speed as required. This card supports half or full duplex operation with the default being half duplex.

Figure 2-27 shows a drawing of the 10/100BaseT Enhanced Vanguard Daughtercard.

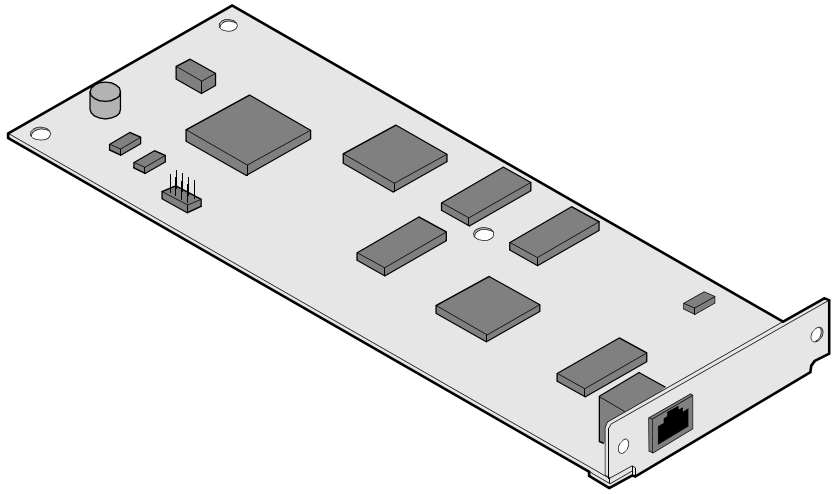


Figure 2-27. 10/100BaseT Enhanced Vanguard Daughtercard

RJ-45 Connector Pinout

The 10/100BaseT Enhanced Vanguard Daughtercard has a single RJ45 connector and is cabled using CAT-5 twisted pair copper cables. This table details the pin for the 10/100Base T RJ45 connector:

Pin	*Signal*	*Pin*	*Signal*
1	Transmit Positive	4	Not Used
2	Transmit Negative	5	Not Used
3	Receive Data Positive	6	Receive Data Negative

EDC LEDs

The 10/100BaseT Enhanced Vanguard Daughtercard has two LEDs built into the rear panel connector. This tables explains the LEDs:

LED	*Description*
Yellow	• On: Active (Tx/Rx activity). • Off: No activity.
Green	• On: The link is up. • Off: The link is down.

Configuring the 10/100BaseT Card

The Vanguard 6435/6455 supports two 10/100BaseT Enhanced Vanguard Daughtercards at a time. The Vanguard 6435/6455 can simultaneously support the onboard Ethernet 10BaseT port (Port 5) and two 10/100BaseT port (Port 10 and/or Port 13, depending on the card's location).

Ethernet Port records can be configured for three ports (providing there are no conflicts between the three records such as bridge link and router interface numbers).

- If you manually configure the onboard 10BaseT Port (Port 5), the 10/100BaseT port (Port 10/13) automatically uses the default Ethernet Port record.
- If you do not configure either port, the 10/100BaseT Port (Port 10/13) uses the default configuration and the 10baseT Port (Port 5) is disabled.
- You can configure the 10/100BaseT Port (Port 10/13) as NULL which effectively disables the port.

For more information about configuring an Ethernet port, refer to the *Ethernet Basics Guide* (Part Number T0109).

Multiple LANs

The Vanguard 6435/6455 can simultaneously support only three LANs in any of these combinations:

- Three Ethernet LANs
- One token Ring LAN and two Ethernet LANs (100 or 10 BaseT)

ATM Enhanced Daughtercard

Introduction

This section describes how to install a T1/E1 ATM Enhanced Daughtercard (Figure 2-28) into a Vanguard 6435 or Vanguard 6455. They support a maximum of two ATM EDCs; each connecting a single port to either a T1 or E1 leased line network.

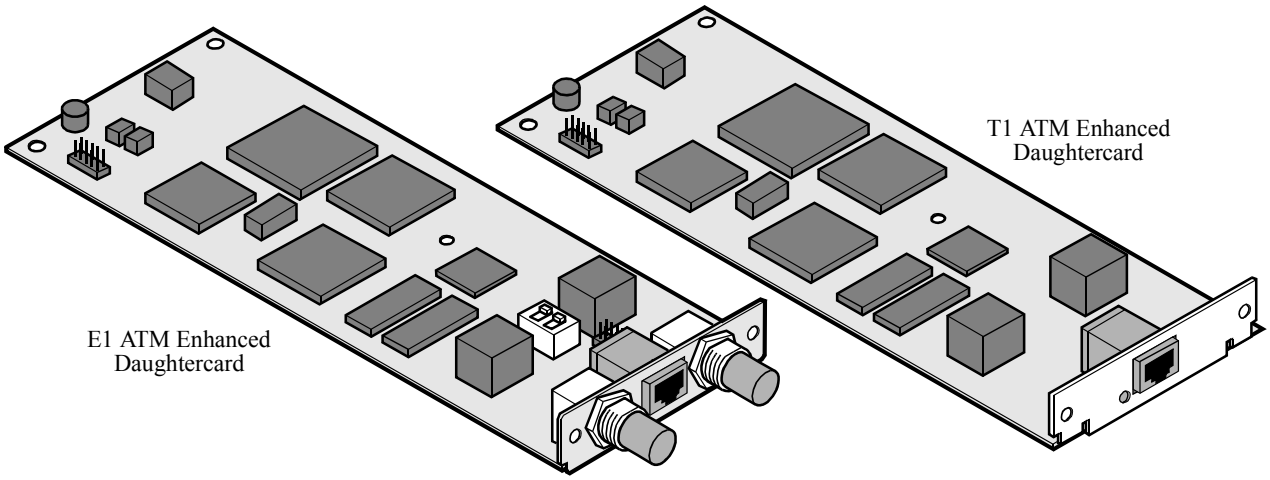


Figure 2-28. ATM T1/E1 EDCs

ATM E1 Switch Settings

The E1 version of the ATM Enhanced Daughtercard contains a block of DIP switches. These are two position slide switches that set connection impedance.

- When all switches are in the on position you select 75 Ω impedance.
- When all switches are in the off position you select 120 Ω impedance.

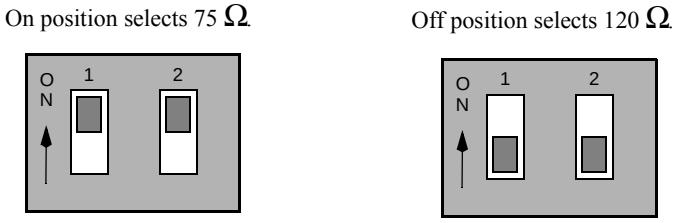


Figure 2-29. ATM E1 Enhanced Daughtercard Switch Settings

There are two versions of the ATM Enhanced Daughtercard, one for T1 and the other for E1 applications. Figure 2-30 shows the rear panel of the T1 version and Figure 2-31 shows the rear panel of the E1 version.

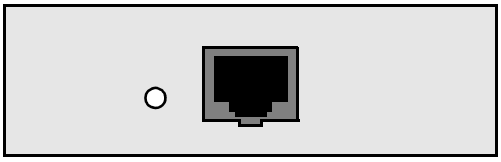


Figure 2-30. ATM Enhanced Daughtercard Rear Panel: T1 Version

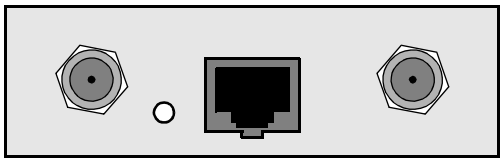
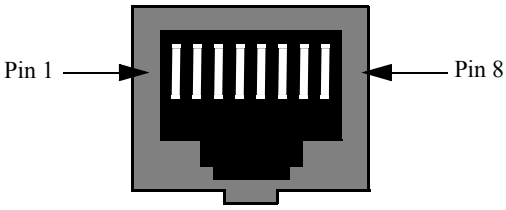


Figure 2-31. ATM Enhanced Daughtercard Rear Panel: E1 Version

ATM EDC Connector Pinouts

Figure 2-32 identifies the connector pinouts found in the RJ48C connectors of both T1 and E1 versions of this Enhanced Daughtercard. Figure 2-33 identifies the pinouts of BNC connectors found on the E1 version.



Pin	Signal	Pin	Signal
1	Receive Ring	5	Transmit Tip
2	Receive Tip	6	No Connection
3	No Connection	7	No Connection
4	Transmit Ring	8	No Connection

Figure 2-32. RJ48C Connector and Pinout

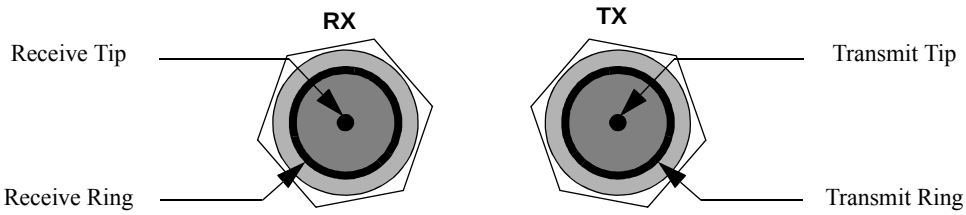


Figure 2-33. BNC Connector: RX and TX

T1/E1 ATM

Release 6.0 and greater includes enhanced ATM functionality for the Vanguard 6435 and 6455. The new enhancements are:

- Annex G Termination
- Variable Bit Rate (VBR) - real time and non-real time

T1E1 ATM Port Configuration

If you are running T1 ATM on a Vanguard 6435 or 6455 Series product, the AAM port may not function after upgrading to release 6.0.R00A or greater (when certain parameters are not at default). You must have local CTP access to the node if this is the case. Do not upgrade to release 6.0.R00A if you have no other way to access the CTP than through ATM. The ATM connection could be down after booting in Release 6.0.R00A or greater.

You must have local CTP access if the following parameters are not configured as follows (prior to the upgrade):

Parameter	*Default*
*Port Type:	AAM
*Maximum VPI Range:	3
*Maximum VCI Range:	127
F5 Link Assurance Timer:	3
F5 Link Assurance Count:	3
CC Activate/Deactivate Timer:	5
CC Activate/Deactivate Count:	3

If these parameters are not set at default, you must reconfigure all AAM ports after release 6.0.R00A or greater has been booted on-line and then reboot the node again. All AAM station configurations are correctly transferred in the upgrade and will function once the AAM port is reconfigured properly.

Vanguard 6435 and 6455 ATM Compression Support

Introduction

Release 6.3 and greater supports the use of compression on a Vanguard 6435 and 6455. Prior to release 6.3 ATM was not designed to support compression over an AAM station (connecting via PVC to LCON stations).

Main Menu->Configure->Configure Network Services

```
Node: 6.3_TEST  Address: 63                  Date:  7-FEB-1999 Time:1:17:59
Menu: Configure Network Services             Path: (Main.6.3)

  1.  Route Selection Table
  2.  PVC Setup Table
  3.  Mnemonic Table
  4.  Network Services Features Table
  5.  DSCP-to-CoS Mapping Profile
  6.  BCUG Table
  7.  Configure QoS
  8.  (reserved)
  9.  (reserved)
 10.  Redirection Table
```

Figure 2-34. Configure Network Services Menu

ATM Compression

Follow the steps in the table below. This configuration allows the data from an LCON-1 to go out to an ATM station compressed.

Step	*Action*
1	Under the Configure Network Services Menu, select PVC Setup Table. Entries are: **Source: aam-10s1** **Destination: lcon-1**
2	Under the Configure Network Services Menu select Network Services Feature Table. Entries are: **Port/Station Identifier: lcon-1** **Data Compression Level: FORCE_ON** **Note** When PVC is configured the Data Compression Level should be set to FORCE_ON.

Vanguard 6455 Option Cards

Introduction

This section describes the Vanguard 6455 Option cards that are currently supported. These include:

- “SDB4 Option Card” on page 2-27
- “Token Ring Card” on page 2-29
- “Voice over IP Convergence Card” on page 2-30

For instructions for installing the cards into a Vanguard 6455, refer to the “Installing/Removing Vanguard 6455 Option Cards” section in Chapter 3.

SDB4 Option Card

Description

The SDB4 Option Card shown in Figure 2-35 is an optional card for the Vanguard 6455 that provides four high speed Sync/Async ports. The card can plug into either or both Option Card slots in the Vanguard 6455 chassis.

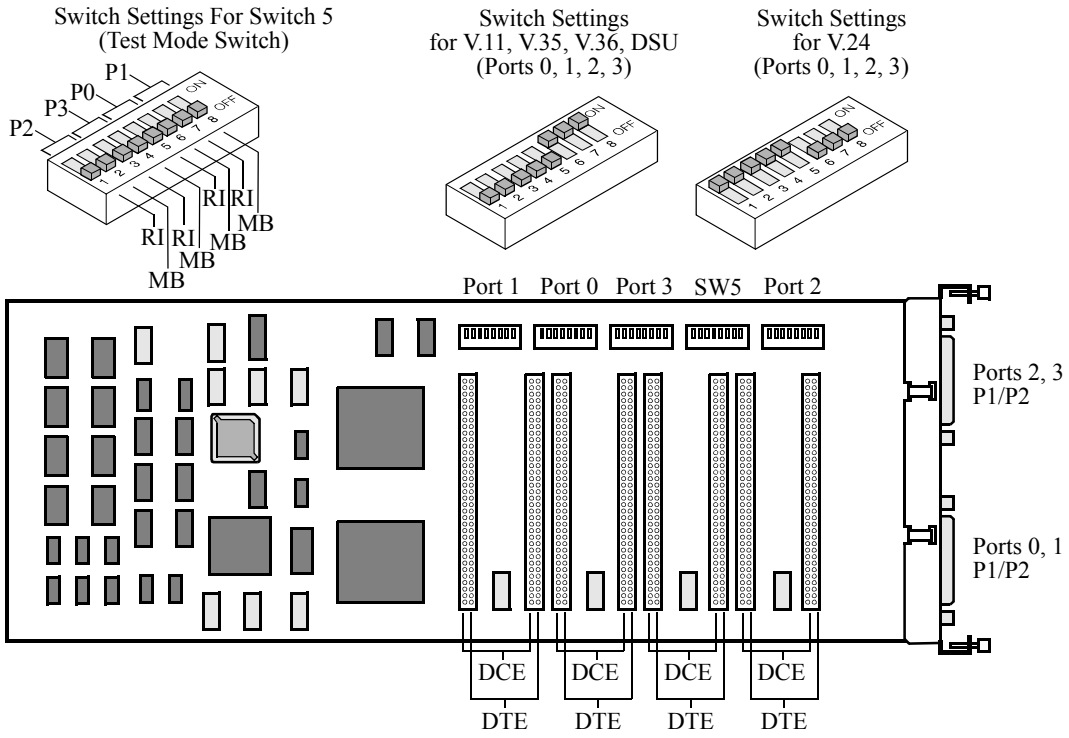


Figure 2-35. SDB4 Option Card

The SDB4 has four DIM-selectable serial sync/async I/O ports. There are two 50 pin connectors on the SDB4 back panel. Two Y-Adapter Cables (one for each 50-pin connector on the back panel) break out into four DB-25 connectors, which allow for standard connection, via cables, to other equipment.

The Vanguard 6455 Option Card differs from the existing Vanguard Daughtercards as follows:

- Supports processor(s) and a high-speed bus interface to the motherboard.
- Supports large cards (4.75 x 12 inches) for external device connection.

Port Description

The SDB4 ports have these characteristics:

- Data Rates up to 2.048 Mbps
- MC68360 processor
- DIM support (Configuration is factory set as specified by your sales order.)
  - V.11 DIM
  - V.24 DIM
  - V.35 DIM
  - V.36 DIM High Speed

DIMs

The SDB4 Option Card supports DIMs that allow the rear panel connectors to function as V.11, V24, V.35, or V.36 ports. Depending on how the DIMs are placed, the ports act as DTE or DCE. Refer to Figure 2-35 for details.

DIM DIP Switches

Depending on the type of DIM, the DIP switches on the SDB4 card must have either of two settings shown in Figure 2-35 and in this table:

Switch Number	*V.11, V.35, V.36, DSU*	*V.24*
1	Off	On
2	Off	On
3	Off	On
4	Off	On
5	Off	On
6	On	Off
7	On	Off
8	On	Off

Test Mode Switch

This table shows the SDB4 Test Mode Switch settings:

Switch No./Name	*On*	*Off*
1: Port 2 RI/TM	Pin 22 is input on Port 2.	Pin 22 is output on Port 2.
2: Port 2 MB	Pin 25 is input on Port 2.	Pin 25 is output on Port 2.
3: Port 3 RI/TM	Pin 22 is input on Port 3.	Pin 22 is output on Port 3.
4: Port 3 MB	Pin 25 is input on Port 3.	Pin 25 is output on Port 3.
5: Port 0 RI/TM	Pin 22 is input on Port 0.	Pin 22 is output on Port 0.
6: Port 0 MB	Pin 25 is input on Port 0.	Pin 25 is output on Port 0.
7: Port 1 RI/TM	Pin 22 is input on Port 1.	Pin 22 is output on Port 1.
8: Port 1 MB	Pin 25 is input on Port 1.	Pin 25 is output on Port 1.

Token Ring Card

Description

The Token Ring Option Card, shown in Figure 2-36, is an optional card for the Vanguard 6455 that provides the following features:

- Routing, Source Route Bridging, and LLC conversion
- Bridging between Ethernet port and Token Ring Port (Translational Bridging)
- Shared token rings with dedicated connection to file servers
- 4-Mbps or 16-Mbps connections
- STP (DB9) and UTP (RJ45) cable types

Note

Only one Token Ring Card can be used in a 6455 at one time.

For information about configuring the Token Ring Card, refer to the *Vanguard Token Ring Basics Guide* (Part Number T0111).

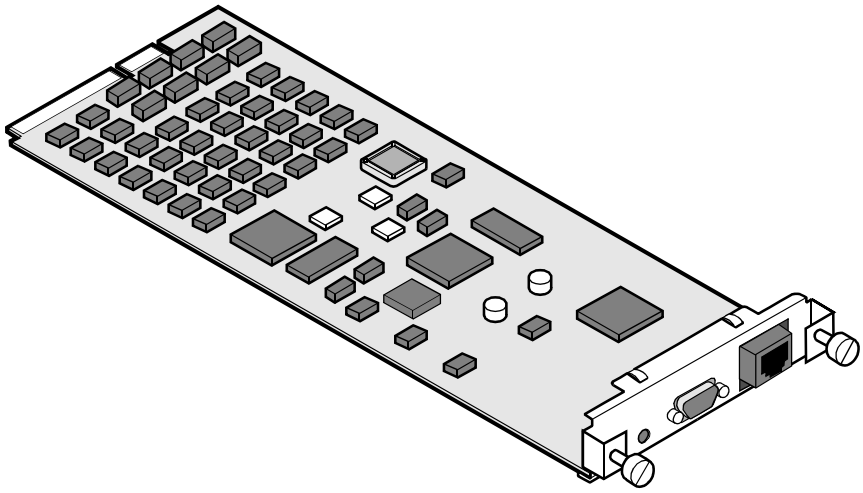


Figure 2-36. Token Ring Option Card

LEDs

There is a single LED on the rear panel:

Status	*Indicates*
On	Inserted into the ring
Off	Removed from the ring
Blinking	Passing data

Port Assignments

The Token Ring card can be installed in either Option card slot:

- Top Option Card Slot, Port 17 (ports 18 to 32 are unassigned)
- Bottom Option Card Slot, Port 33 (ports 34 to 48 unassigned)

Note

See Figure 2-4 for the card slot locations and port assignments.

Voice over IP Convergence Card

Description

The Voice over IP (VoIP) Convergence Card, shown in Figure 2-37, is an optional card for the Vanguard 6455. Coupled with DSP SIMM cards that mount to this option card, the VoIP Convergence Card provides these features:

- Supports 30 voice channels for the E1 card and 24 voice channels for the T1 card.
- Supports 31 virtual data ports for the E1 card and 24 virtual data ports for the T1 card.
- Supports two DSP SIMM cards: a card with eight channels (two DSPs) and a card with 16 channels (four DSPs).
  - E1 version should use two, sixteen channel (four DSP) SIMM cards to use its full E1 capability.
  - T1 version should use one, eight channel (two DSP) SIMM card and one, sixteen channel (four DSP) SIMM card to use its full T1 capability.
- Supports any combination of voice and data.
- Provides aggregated data traffic speed of 2.048 Mbps of data traffic flexibly from 1 to 31 virtual data ports.

Note

Increased feature card performance for the Vanguard 6455 is available with Release 6.2 and greater software.

Caution

Configure interface 4 and 6 for interface 5 and 7 to initialize. Always configure both interfaces even if only the second interface on the card is used.

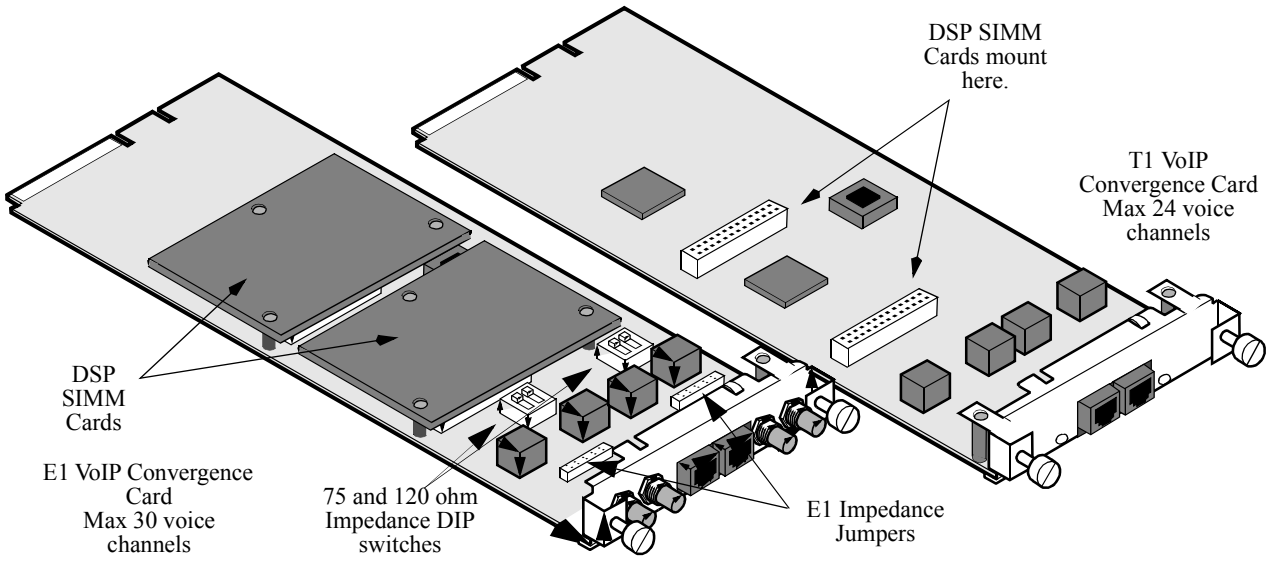


Figure 2-37. VoIP Convergence Cards

Each Vanguard 6455 can support two of either the T1 or E1 version of the VoIP Convergence Card. You cannot, however, install one of each card version in any one Vanguard 6455. When cards are installed in a Vanguard 6455, interfaces are assigned as illustrated in Figure 2-38.

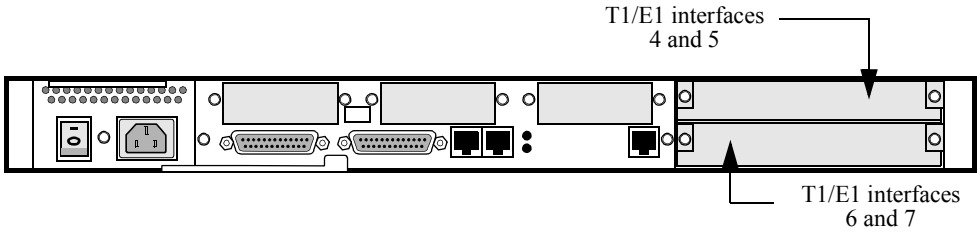


Figure 2-38. VoIP Convergence Card Interface Assignments

Note

For information regarding the mapping of ISDN interfaces, please refer to the Vanguard ISDN manuals (Part Numbers T0103-05 and T0103-06).

T1 and E1 Versions

There are two versions of the VoIP Convergence Card, one for T1 and the other for E1 applications. Figure 2-39 shows the rear panel of the T1 version and Figure 2-40 shows the rear panel of the E1 version.

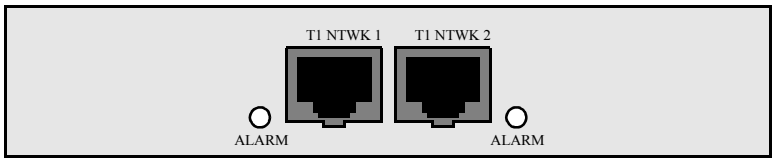


Figure 2-39. VoIP Convergence Card Rear Panel: T1 Version

Figure 2-40. VoIP Convergence Card Rear Panel: E1 Version

Caution

You can install two T1 ***or*** two E1 VoIP Convergence Cards in one Vanguard 6455. The Vanguard 6455 does not operate correctly if you install T1 and E1 versions in the same unit.

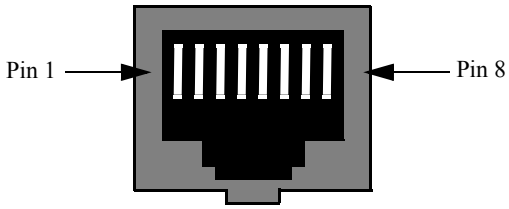
The T1 version of this option card supports a maximum of 24 voice channels. The E1 version supports a maximum of 30 voice channels. DSP SIMM Cards must be installed on the VoIP Convergence Card to support voice channels. If these SIMM Cards are not mounted to the option card, it supports data transmission only.

Alarm LEDs

Each interface is supported by an alarm LED that illuminates whenever an error is detected on the T1/E1 interface.

Rear Panel Connectors

The T1 version of the VoIP Convergence Card has two RJ48C connectors. The E1 version of the card has two RJ48C and four BNC connectors. Figures 2-41 and 2-42 show these connectors.



Pin	Signal	Pin	Signal
1	Receive Ring	5	Transmit Tip
2	Receive Tip	6	No Connection
3	No Connection	7	No Connection
4	Transmit Ring	8	No Connection

Figure 2-41. RJ48C Connector and Pinout

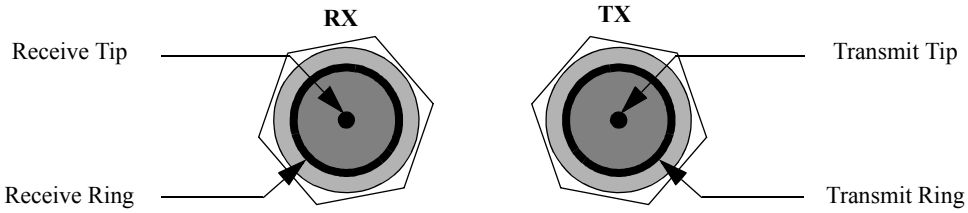


Figure 2-42. BNC Connector: RX and TX

E1 Line Impedance Adjustments

Each E1 line termination can be set to either 75Ω or 120Ω using the DIP switch on the card (shown in Figure 2-37). The line impedance can be adjusted to either of these settings as illustrated in Figure 2-43.

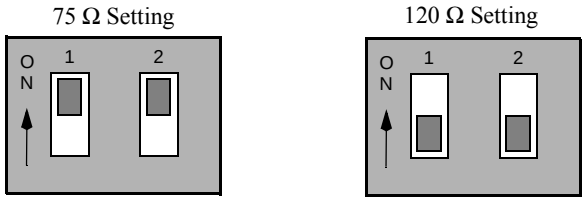


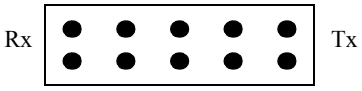
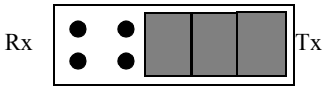
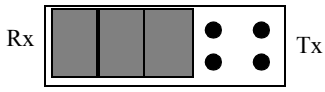
Figure 2-43. E1 Impedance DIP Switches

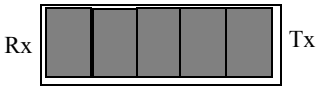
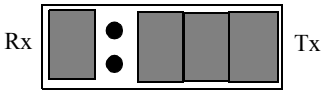
Note

The T1 line impedance is permanently set to 100Ω.

E1 Card Impedance Jumper Settings

These jumpers reside behind the BNC connectors on the VoIP Convergence Card (see Figure 2-37 and Figure 2-44). Use these jumpers to ground the Tx ring and/or the Rx ring on the BNC connectors. these jumpers control the BNC pair directly in front of them. This table details the jumpers' use:

Description	*Use*	*Jumper Configuration*
The terminals are balanced and are not grounded. **Note** For 120Ω twisted pair applications, all jumper shunts must be removed from the pins to provide at least 2.5mm clearance between network lines (TRing and Rring) and ground.	This jumper configuration is required to connect a balanced 120Ω twisted pair E1 network. **Note** This is the only configuration for 120Ω impedance setting.	
The TRing (the coax shield for the Tx pair) is grounded directly. The Rring (the coax shield for the Rx pair) is not grounded.	This jumper configuration is normally used to connect an unbalanced 75Ω coax to BNC connectors on an E1 network.	
The TRing (the coax shield for the Tx pair) is not grounded. The Rring (the coax shield for the Rx pair) is grounded directly.	This configuration may be used with certain unbalanced 75Ω coax E1 networks. **Note** Use this configuration only if the network provider requests it. The ITU requires this setting.	

Description	Use	Jumper Configuration
The TRing (the coax shield for the Tx pair) is grounded directly. The Rring (the coax shield for the Rx pair) is grounded directly.	This configuration may be used with certain unbalanced 75Ω coax E1 networks. **Note** Use this configuration only if the network provider requests it. The ITU requires this setting.	
The TRing (the coax shield for the Tx pair) is grounded directly. The Rring (the coax shield for the Rx pair) is grounded through a decoupling capacitor.	This configuration may be used with certain unbalanced 75 ohm coax E1 networks. **Note** This setting may be required in Australia and New Zealand.	

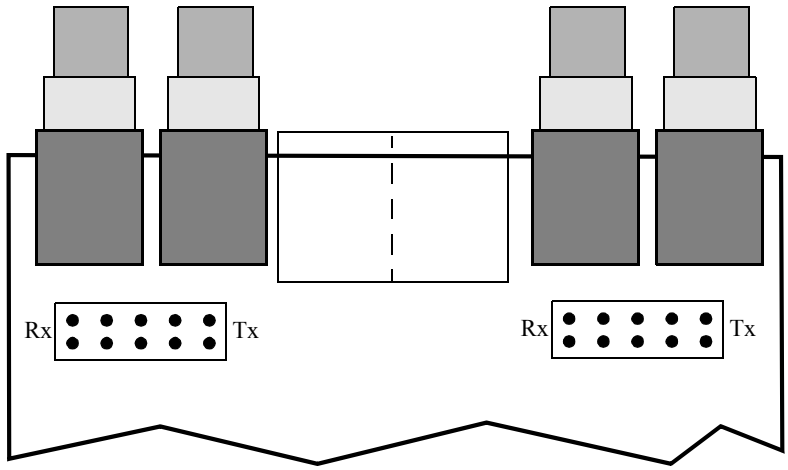


Figure 2-44. E1 Card Impedance Jumper Locations

Chapter 3
Installation and Replacement

Overview

Introduction

This chapter provides instructions for the following tasks:

- Installing a Vanguard 6435/6455.
- Modifying your unit.
- Installing and replacing the battery.
- Turning the battery on and off.

Checking Your Shipment Contents

List of Contents

Before you install the Vanguard 6435/6455, make sure your shipment contents are complete.

The Vanguard 6435/6455 is packaged in shock-absorbent packing material. Inside your shipping carton, you should find the contents shown in Figure 3-1.

Vanguard 6435/6455 Shipping Contents

- Vanguard 6435/6455 enclosure
- Power cord

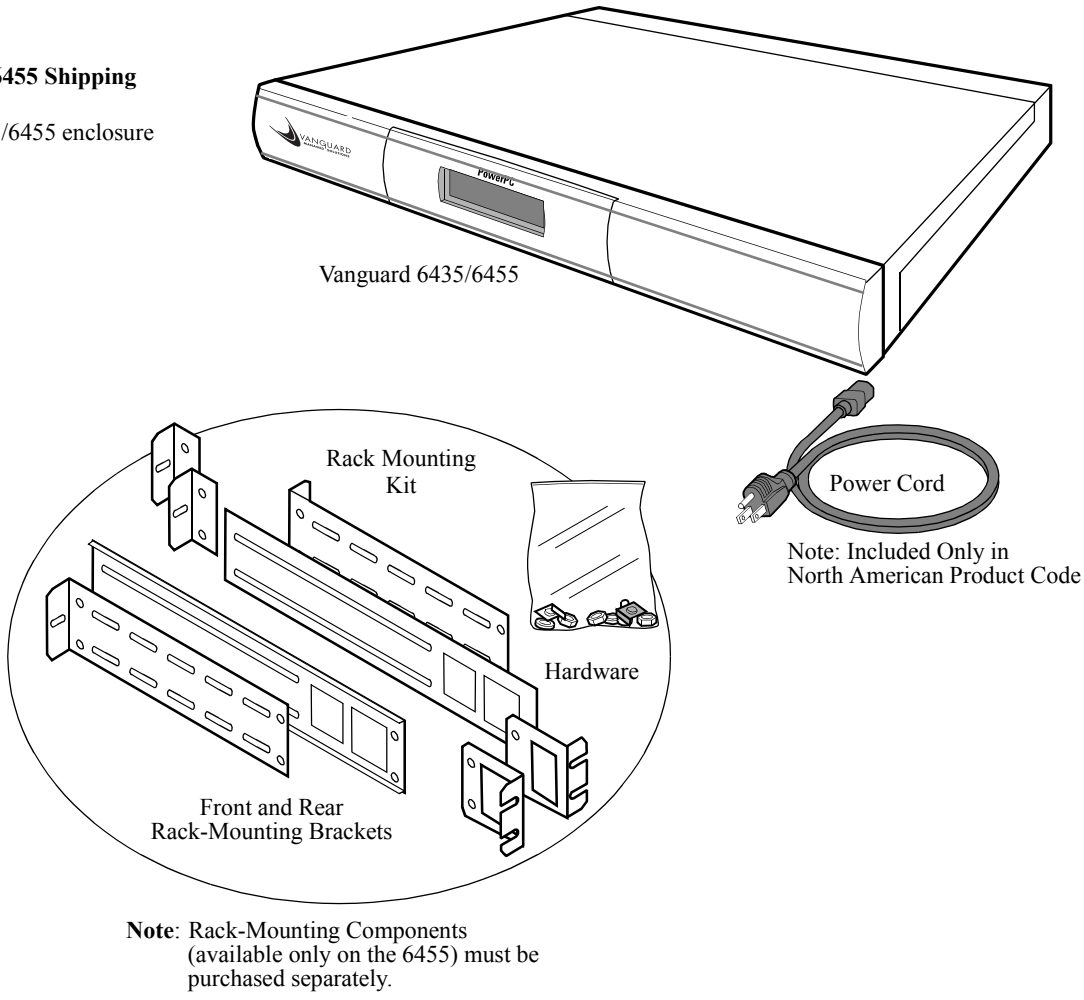


Figure 3-1. Vanguard 6435/6455 Shipping Contents

Installing The Vanguard 6435/6455

Introduction

This section explains how to install the Vanguard 6435/6455. It consists these sections:

- Selecting and preparing the installation site.
- Standalone installation.
- Rack mount Installation (6455 only).
- Thermal considerations.
- Cabling.

After the Vanguard 6435/6455 is installed and cabled, go to Chapter 4, Powering Up Your Vanguard 6435/6455 for instructions for powering-up the unit.

Installing the Standalone Version

How to Choose a Site

Before you install a standalone version of the Vanguard 6435/6455, select a site for the device.

Choose a site that is within an appropriate distance of a power source. Depending on your application, and the country in which the Vanguard 6435/6455 is to operate, the power source must be a grounded 110 to 220 Vac outlet.

Leave at least 2 inches (5 cm) of clearance in front of the front panel, to allow you to see the front panel display, and behind the unit for cable clearances (see Figure 3-2). For proper ventilation, leave 2 inches (5 cm) of clearance on the sides.

The site should be free of accumulated dust and environmental extremes. Refer to Appendix A, Specifications for details.

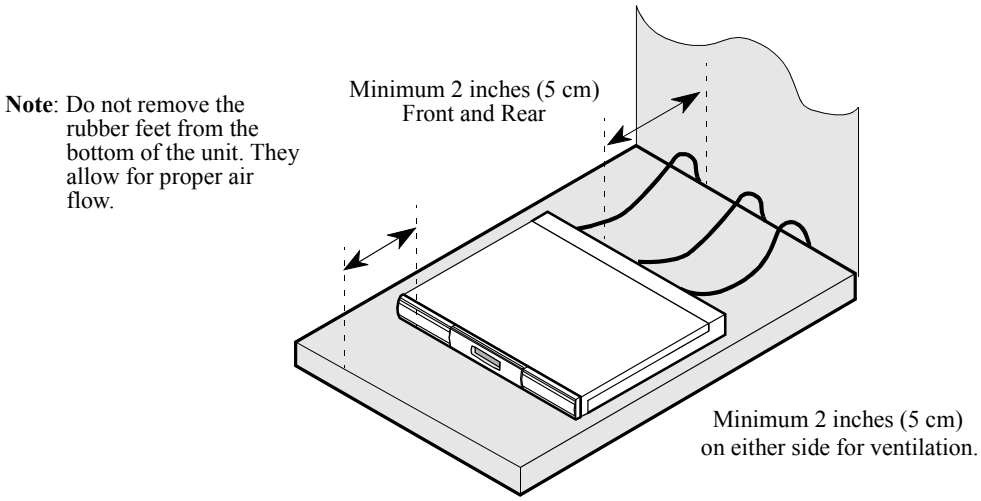


Figure 3-2. Proper Cable and Air Clearance

Caution

Vanguard 6435/6455 devices should be used in environments designed for computers and electronic equipment. In areas susceptible to lightning, take precautions to prevent damage to electronic equipment. Contact your telephone company or an electronic accessories vendor for information on lightning protection equipment. Customers experiencing problems caused by surges from lightning have eliminated such problems by installing appropriate surge suppressors on power and data lines connected to the Vanguard 6435/6455 devices.

Installation

Complete these steps to install the stand-alone version:

Step	*Action*
1	Unpack the Vanguard 6435/6455, and inspect the unit to ensure you have all the components.
2	Install any daughtercards, option cards, SIMMs, or DIMs that you need to add to the unit, as necessary.
3	Be sure that the four rubber feet are on the bottom of the enclosure.
4	Attach the power cord and cables to the rear panel. Refer to the "Cabling Your Vanguard 6435/6455" section on page 3-9 for cabling information.
5	Place the enclosure in the selected site, and power unit on. Do not block the fan inlet or outlet vents.
6	Ensure the fan is operational after powering the unit on by checking to see if air blows out of the unit.
7	Ensure that the ambient temperature at the fan inlet is within the temperature range specified in Appendix A.

Note

You can stack as many as five Vanguard 6435/6455 units on top of each other.

Caution

Do not place items weighing more than 20 pounds (9 kg) on top of a Vanguard 6435/6455 enclosure.

Installing the 6455 Rack Mount Version

Introduction

This section explains how to install the rack mount version of the Vanguard 6455.

Be sure that you have the mounting brackets that came with the unit.

Installation Variation

When rack-mounting a Vanguard 6455, you can orient the unit in either of two ways:

- Front Panel Forward: The front panel faces the front of the rack. This allows you to easily read the LCD panel display. The cables run out the rear of the rack.
- Rear Panel Forward: The rear panel faces the front of the rack. This allows you to easily access the cables and to replace and install the motherboard and cards.

For either mounting method, refer to Figure 3-3.

Rack-Mount Cautions

Take note of these considerations before and after rack-mounting your Vanguard 6455.

Caution

It is possible to subject the rack-mounted Vanguard 6455 to high temperatures. Be sure the ambient temperature in the equipment rack and around the inlets of the cards and power supply does not exceed the recommended temperature limits listed in Appendix A.

Caution

Be sure that the rack-mounted Vanguard 6455 has adequate air flow for cooling purposes. Leave a minimum of 2 inch (5 cm) clearance on each side. (Inadequate airflow can cause thermal shutdown of the power supply.)

Caution

When mounting a Vanguard 6455 in a rack, be sure the mounting screws are adequately tightened so the enclosure does not bend or fall.

Caution

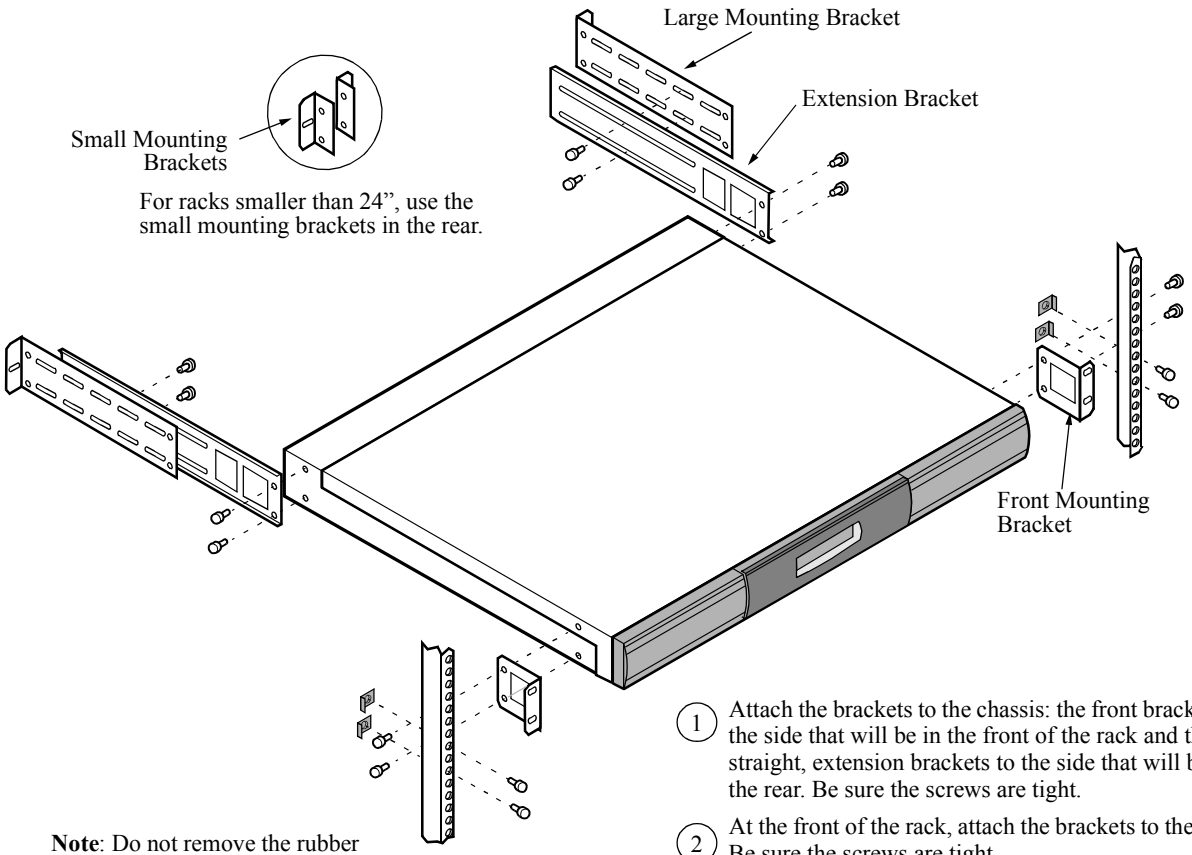
Be sure that the power circuit to which the Vanguard 6455 is connected is not overloaded.

Caution

Be sure that the rack-mounted Vanguard 6455 is properly grounded at all times.

Installation

Figure 3-3 explains how to install a Vanguard 6455 into an equipment rack.



Note: Do not remove the rubber feet from the bottom of the enclosure. The rubber feet prevent multiple Vanguard 6455s from being stacked too closely (and restrict air flow).

1. Attach the brackets to the chassis: the front brackets to the side that will be in the front of the rack and the straight, extension brackets to the side that will be to the rear. Be sure the screws are tight.
2. At the front of the rack, attach the brackets to the rails. Be sure the screws are tight.
3. At the rear of the rack, attach the mounting brackets to the extension brackets. Use the large or small mounting brackets as needed. Adjust the mounting brackets until they line up with the rails. Tighten the screws to the extension bracket and then to the rails.

Figure 3-3. Installing the Vanguard 6455 Into a Rack

Thermal Considerations

Introduction

This section explains some of the heat and temperature factors that can affect your Vanguard 6435/6455.

Fan

After the unit is installed, power it up and check that the fan is working properly.The feet must be installed and air should be blowing out of the unit.

Inlet Temperature

After the unit is running, check the ambient air temperature. Make sure it does not exceed the operating temperature limits specified in Appendix A.

Thermal Shutdown

If a Vanguard 6435/6455 is not properly cooled, the power supply will overheat and shut down. This is called Thermal Shutdown. The power supply remains off until it cools, after which it automatically comes back on.

Thermal Shutdown can occur if the Vanguard 6435/6455's internal temperature is too high because of any of these conditions:

- Blocked vents
- Insufficient clearance around the unit
- Air inlet temperatures exceeds the operating limits

After it cools, the unit powers on again. However, the unit will continue to automatically shut down until the problem is corrected.

Cabling Your Vanguard 6435/6455

Introduction

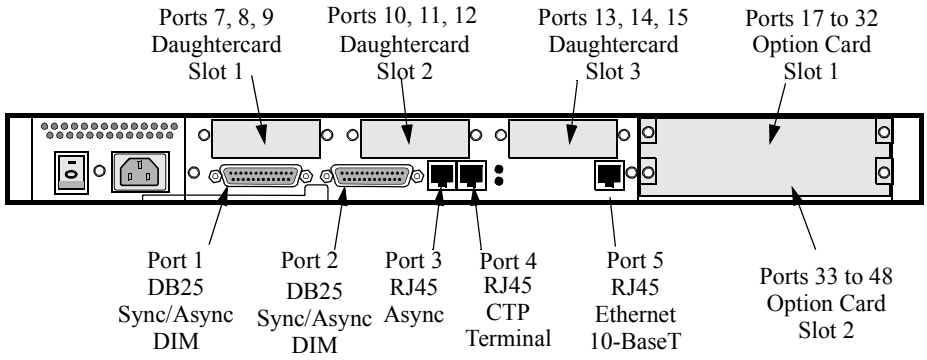
This section provides information to help you cable your Vanguard 6435/6455.

Caution

Before connecting cables to the motherboard or daughtercard ports (ports 1 to 15), be sure that the screws holding the motherboard in place are tight. If the screws are loose, the motherboard could loosen under the weight of the cables and cause damage to the equipment.

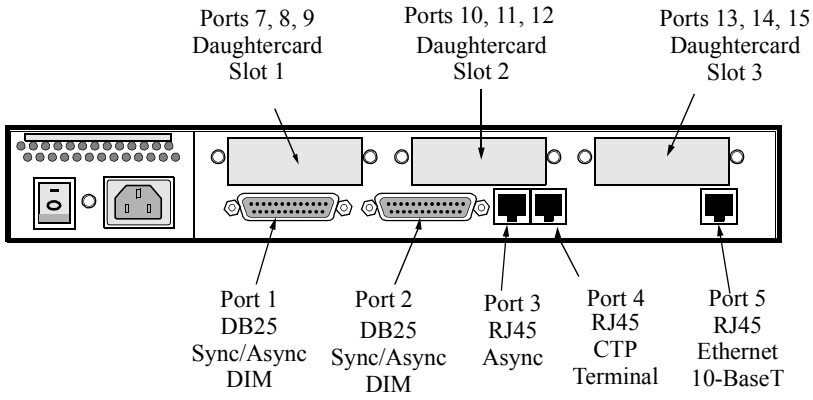
Rear Panel Ports

Figure 3-4 shows the port number on the Vanguard 6455 rear panel and Figure 3-5 shows the port numbers on the Vanguard 6435 rear panel.



Note: You must not connect Ports 3, 4, or 5 to the Public Communications Network (PCN).

Figure 3-4. Vanguard 6455 Rear Panel Port Numbers



Note: You must not connect Ports 3, 4, or 5 to the Public Communications Network (PCN).

Figure 3-5. Vanguard 6435 Rear Panel Port Numbers

Caution

Do not connect the Ports 3, 4, or 5 to the Public Communications Network.

Note

When installing a daughtercard with only one port, the port number is 7, 10, or 13 (depending on the location of the card).

Rear Panel Ports

There are five physical ports on the Vanguard 6435/6455 rear panel.

Ports 1 and 2

These ports have Sync/Async DB25 connectors. Depending on the DIM installed, they can support V.11, V24, V.35 and V.36. They can also be configured as DTE or DCE ports.

These tables describe the DB25 connector pinouts for Ports 1 and 2:

DB25 V.24 Pinouts (with DIM in DCE position)

Pin	*ITU Circuit*	*I/O*	*Signal Name*
1	---	-----	Protective Ground
2	103	INPUT	Transmitted data
3	104	OUTPUT	Received data
4	105	INPUT	Request To Send
5	106	OUTPUT	Clear To Send
6	107	OUTPUT	Data Set Ready
7	102	-----	Signal Ground
8	109	OUTPUT	Data Carrier Detect
14	---	INPUT	Data Restraint Out
15	114	OUTPUT	Transmitted Clock
16	117	OUTPUT	Standby Indicator
17	115	OUTPUT	Received Clock
18	---	INPUT	External Rx Clock
20	108/2	INPUT	Data Terminal Ready
21	140	INPUT	V54 Loop 2
22	125	OUTPUT	Ring Indicator
24	113	INPUT	External Rx Clock
25	142	OUTPUT	Test Indicator

DB25 V.24 Pinouts (with DIM in DTE position)

Pin	ITU Circuit	I/O	Signal Name
1	---	-----	Protective Ground
2	103	OUTPUT	Transmitted Data
3	104	INPUT	Received Data
4	105	OUTPUT	Request To Send
5	106	INPUT	Clear To Send
6	107	INPUT	Data Set Ready
7	102	-----	Signal Ground
8	109	INPUT	Data Carrier Detect
14	---	OUTPUT	Data Restraint Out
15	114	INPUT	Transmitted Clock
16	117	INPUT	Standby Indicator
17	115	INPUT	Received Clock
18	141	OUTPUT	V54 Loop 3
20	108/2	OUTPUT	Data Terminal Ready
21	140	OUTPUT	V54 Loop 2
22	125	INPUT	Ring Indicator
24	113	OUTPUT	External Tx Clock
25	142	INPUT	Test Indicator

DB25 V.35/V.36 Pinouts

Pin	Signal	DCE Position	DTE Position
1	GND	-------	-------
2	TXDA	IN	OUT
3	RXDA	OUT	IN
4	RTS	IN	OUT
5	CTS	OUT	IN
6	DSR	OUT	IN
7	SIGGND	-------	-------
8	DCD	OUT	IN
14	TXDB	IN	OUT
15	TXCA	OUT	IN
16	RXDB	OUT	IN
17	RXCA	OUT	IN

DB25 V.35/V.36 Pinouts *(continued)*

Pin	Signal	DCE Position	DTE Position
18	RXCB	OUT	IN
20	DTR	IN	OUT
21	TXCB	OUT	IN
22	ETXCB	IN	OUT
24	ETXCA	IN	OUT
25 (V.36 only)	TM	NC	IN

DB25 V.11/X.21 Pinouts

Pin	Signal	DCE Position	DTE Position
1	GND	-------	-------
2	TXDA	IN	OUT
3	RXDA	OUT	IN
4	RTSA	IN	OUT
6	DCDB	OUT	IN
7	SIGGND	-------	-------
8	DCDA	OUT	IN
14	TXDB	IN	OUT
15	TXCA	OUT	IN
16	RXDB	OUT	IN
20	RTSB	IN	OUT
21	TXCB	OUT	IN
22	ETXCB	IN	OUT
24	ETXCA	IN	OUT

Ports 3 and 4

These ports have RJ-45 connectors. Use Port 4 as the CTP because Port 3 cannot be used for coldloading software to the node. Figure 3-6 shows the pin numbers for ports 3 and 4.

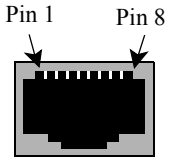


Figure 3-6. Ports 3/4 Pin Numbers

This table shows the pinouts for RJ-45 connectors for Ports 3 and 4:

Pin Number	Port 3/Port 4 (CTP)	
	Signal	DCE
1	RTS	Input
2	DTR	Input
3	RXD	Output
4	DCD	Output
5	GND	-------
6	TXD	Input
7	DSR	Output
8	CTS	Output

Note

Use Ports 3 and 4 only with low speed asynchronous protocols. Running asynchronous protocols at speeds greater than 19.2 kbps may degrade node performance.

Port 5

This table shows the pinouts for the RJ45 Ethernet connector for Port 5:

Pin	Signal
1	Transmit Positive
2	Transmit Negative
3	Receive Data Positive
4	Not Used
5	Not Used
6	Receive Data Negative

Cabling Daughtercards

For instructions on cabling your standard Vanguard Daughtercards, refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020).

For instructions on cabling your Enhanced Vanguard Daughtercards, refer to the “Installing/Removing Enhanced Vanguard Daughtercards” section on page 3-27.

Cabling SDB4 Option Card

The SDB4 Option Card comes with two Y-Cable Adapters as shown in Figure 3-7. They allow each connector on the rear of the SDB4 Option Card to support two ports.

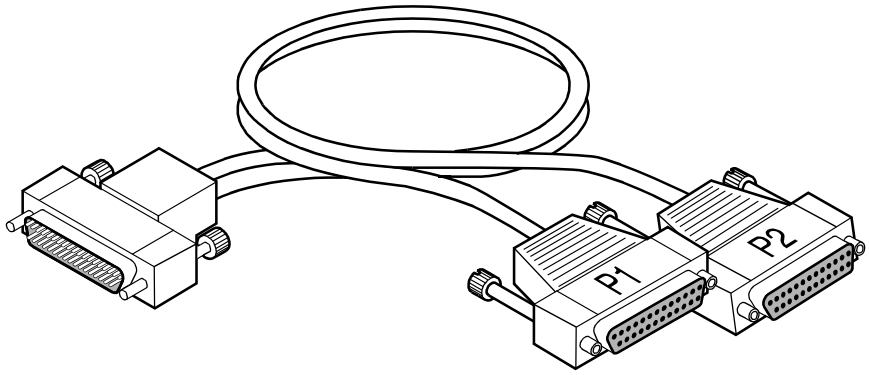


Figure 3-7. SDB4 Option Card Y-Cable

Modifying Your Vanguard 6435/6455

Introduction

You can modify your Vanguard 6435/6455 by adding or replacing components on the motherboard. In addition, if you have a Vanguard 6455, you can add and replace Option Cards. This section explains how to make these modifications.

Daughtercards

You can install up to three Vanguard Daughtercards in the Vanguard 6435/6455.

- For information about installing a standard Vanguard Daughtercard, refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020).
- For information about installing an Enhanced Vanguard Daughtercard, turn to "Installing/Removing Enhanced Vanguard Daughtercards" section on page 3-27).

Note

When installing a Vanguard Daughtercard into a 6435/6455, you must use the shorter two-sided header. The taller header is used with other Vanguard units.

Accessing the Motherboard

Introduction

This section explains how to access the motherboard for the Vanguard 6455 and the Vanguard 6435. It also identifies the location of the key motherboard components.

Before replacing DIMs, SIMMs, batteries, or daughtercards, or setting DIP switches, you must access the Vanguard 6435/6455 motherboard.

Note

Because the 6455 and the 6435 have different enclosures, the procedures for accessing the motherboard is different for each device.

Instructions for the 6455

Figure 3-8 shows how to remove and install the Vanguard 6455 motherboard. Figure 3-10 shows the location of the components on the motherboard.

Warning

To prevent injury and damage to the equipment, power down the unit and disconnect the power cord before you remove or install the motherboard.

Avertissement

Pour éviter toute blessure ou endommagement de l'équipement, éteignez l'unité et déconnectez le cordon d'alimentation avant d'enlever ou d'installer la carte mère.

Warnung

Um persönliche Verletzungen und Schäden am Gerät zu verhindern, schalten Sie das Gerät ab, und ziehen Sie den Netzstecker aus, bevor Sie die Hauptplatine entfernen oder installieren.

Caution

Use care when handling and placing the motherboard on a surface. There are components on the bottom of the motherboard that can be damaged.

Caution

Some components used in the 6455 are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

Mise en Garde

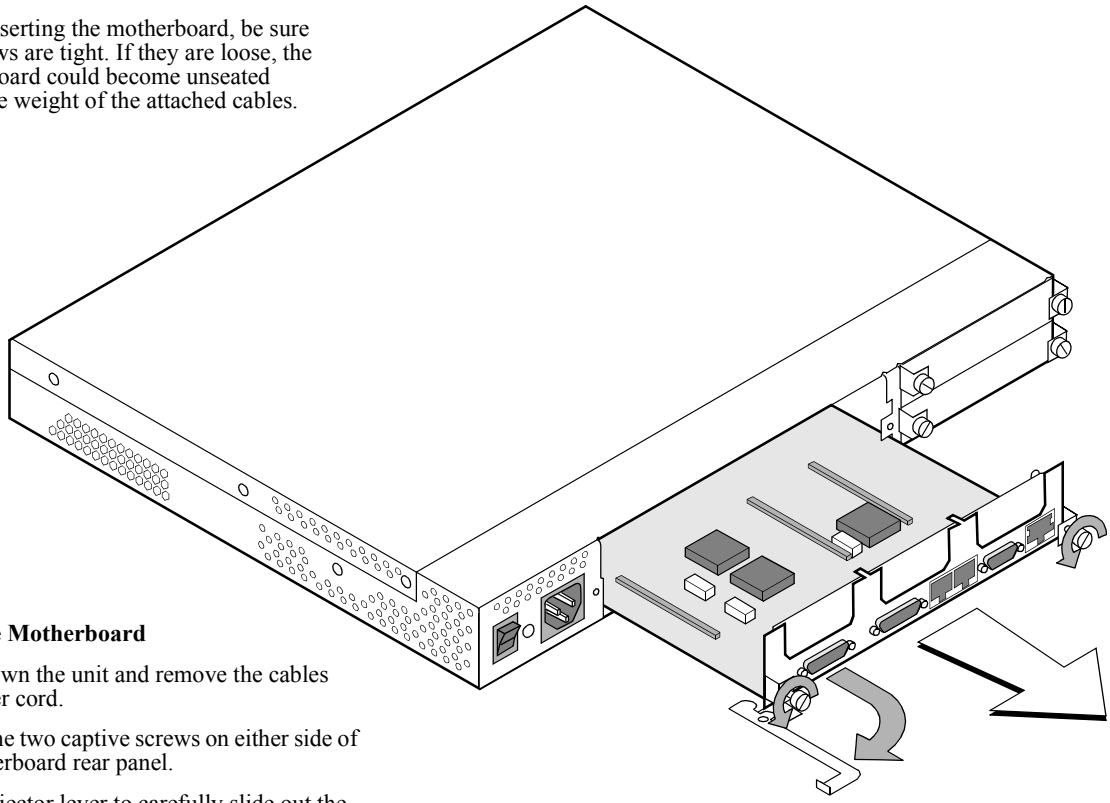
Certains composants du 6455 sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Vorsicht

Einige im 6455 verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

Caution

When inserting the motherboard, be sure the screws are tight. If they are loose, the motherboard could become unseated under the weight of the attached cables.



Removing the Motherboard

1. Power down the unit and remove the cables and power cord.
2. Loosen the two captive screws on either side of the motherboard rear panel.
3. Use the ejector lever to carefully slide out the motherboard.
4. Place the motherboard on a clean flat surface.

Installing the Motherboard

1. Carefully slide the motherboard into the card guides within the opening. Push the motherboard into the enclosure (make sure lever is flat against the back panel). Make sure the edge connectors seat properly by pressing firmly on the thumbscrews.
2. Hand tighten the captive screws on both sides of the rear panel. *Be sure the screws are snug*.
3. Reconnect the cables and power cord and power up the unit.

Figure 3-8. Vanguard 6455 Motherboard Removal and Replacement

Instructions for the 6435

Figure 3-9 shows how to access the Vanguard 6435 motherboard. Figure 3-10 shows the location of the components on the motherboard.

Warning

To prevent injury and damage to the equipment, power down the unit and disconnect the power cord before you remove or install the motherboard.

Avertissement

Pour éviter toute blessure ou endommagement de l'équipement, éteignez l'unité et déconnectez le cordon d'alimentation avant d'enlever ou d'installer la carte mère.

Warnung

Um persönliche Verletzungen und Schäden am Gerät zu verhindern, schalten Sie das Gerät ab, und ziehen Sie den Netzstecker aus, bevor Sie die Hauptplatine entfernen oder installieren.

Caution

The Vanguard 6435 motherboard is sensitive to electrostatic damage, which can damage components. Use proper ESD handling and grounding precautions when handling a motherboard.

Mise en Garde

La carte mère du Vanguard 6435 est sensible aux effets de l'électrostatique qui risquent d'endommager les composants. Veuillez prendre les dipositions et précautions de mise à la terre nécessaires en matière de dommages électrostatiques lors de la manipulation d'une carte mère.

Vorsicht

Bauteile des Vanguard 6435-Motherboard können durch elektrostatische Störungen beschädigt werden. Sorgen Sie für die Einhaltung von Maßnahmen zur elektrostatischen Entladung und Erdung.

Caution

Use care when handling and placing the motherboard on a surface. There are components on the bottom of the motherboard which can be damaged.

Mise en Garde

Veuillez manipuler avec précaution la carte mère lorsque vous la placez sur une surface. Certains composants situés sous la carte mère risquent d'être endommagés.

Vorsicht

Das Motherboard muß sehr vorsichtig behandelt werden. Wenden Sie besondere Vorsicht an, wenn Sie das Motherboard auf eine Fläche aufstellen. Die Bauteile an der Unterseite könnten beschädigt werden.

Caution

Some components used in the 6435 are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

Mise en Garde

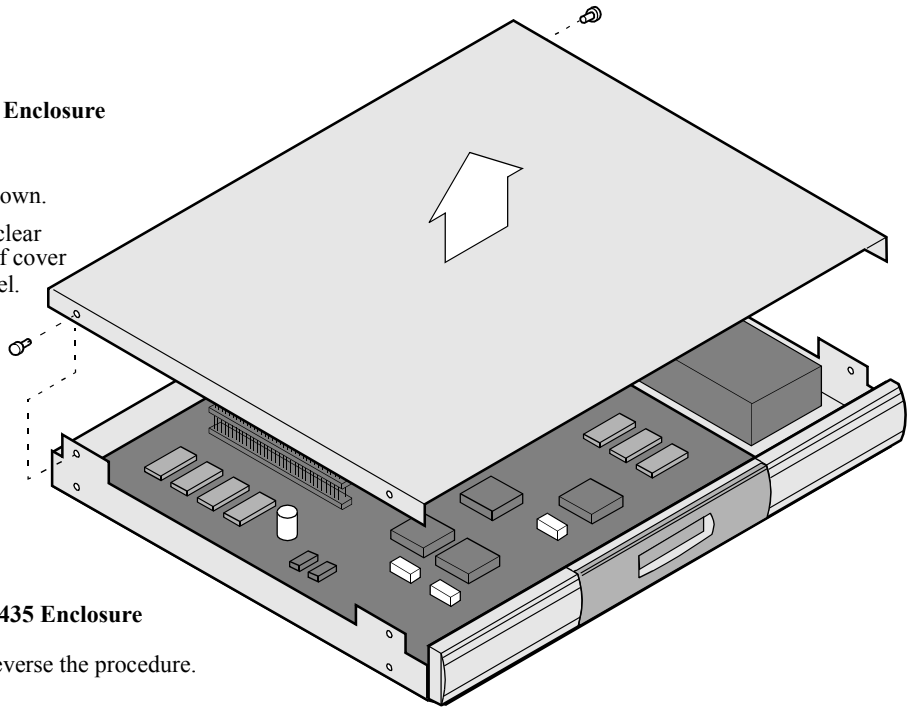
Certains composants du 6435 sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Vorsicht

Einige im 6435 verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

Opening the Vanguard 6435 Enclosure

1. Remove the two screws from the top cover as shown.
2. Slide the cover back to clear tabs, then lift rear part of cover up to clear the back panel.
3. Lift the cover from the 6435 chassis



Closing the Vanguard 6435 Enclosure

1. To replace cover, reverse the procedure.

Figure 3-9. Opening the Vanguard 6435 Enclosure

Motherboard Components

Figure 3-10 shows the components on a Vanguard 6435/6455 motherboard.

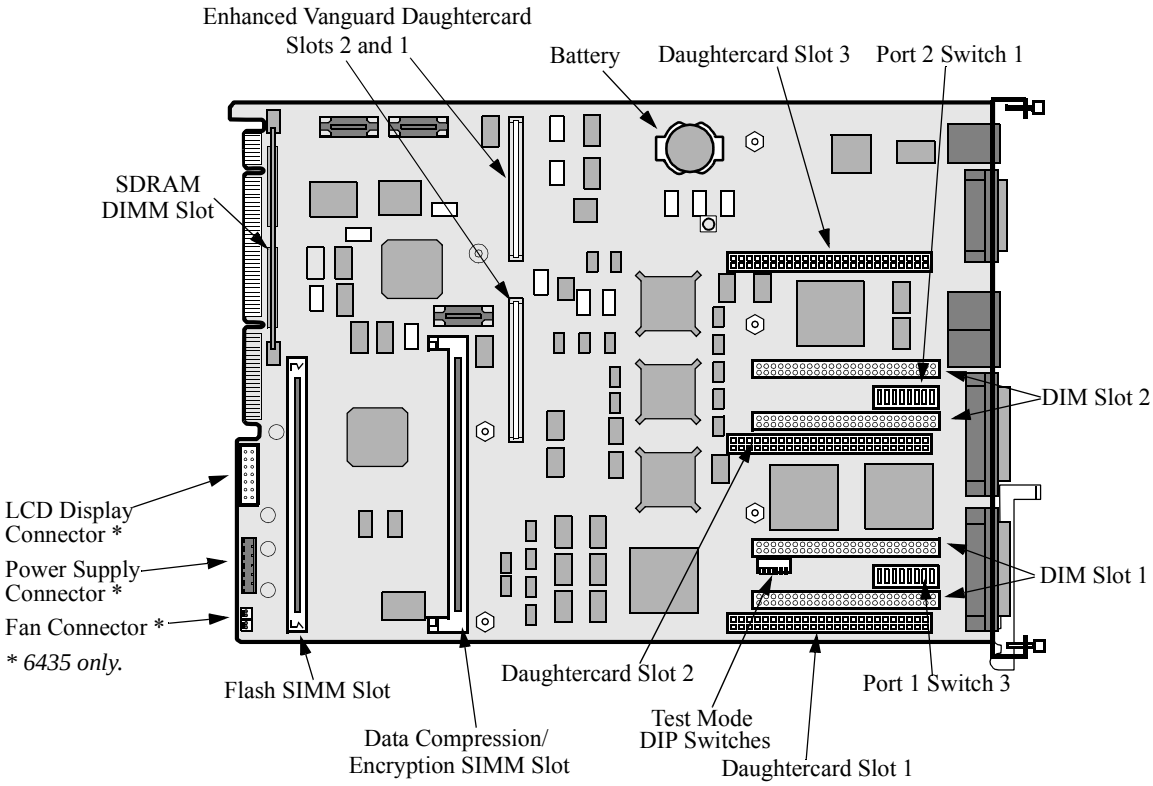


Figure 3-10. Location of Motherboard Components

DIMs, SIMMs, DIMMs and Switches

Introduction

The appropriate DIMs and SIMMs should have been installed on the motherboard at the factory. If they are not, you can install the components.

This section explains how to:

- Add and remove DIMs.
- Setting DIM DIP Switches.
- Add and remove SIMM and DIMMs (SDRAM, FLASH, Data Compression, Encryption).
- Set Switches.

For instructions for removing the motherboard, refer to the "Accessing the Motherboard" section on page 3-16.

Adding or Removing a DIM

Refer to Figure 3-10 for the location of the DIM Slots. Placement of the DIM determines if the associated ports acts as a DTE or DCE (see Figure 3-11).

Figure 3-11 shows how to position a DIM on the Vanguard 6435/6455 motherboard and set the DIM DIP switches. The Vanguard 6435/6455 supports V.11, V.24, V.35, V.36, and DSU DIMs.

For instructions for removing the motherboard, refer to the "Accessing the Motherboard" section on page 3-16.

Note

The DIM DIP switches are located under the DIMs. Therefore, before you can reset the switches, you must remove the DIM.

Caution

Some components used in the 6435/6455 are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

Mise en Garde

Certains composants du 6435/6455 sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Vorsicht

Einige im 6435/6455 verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

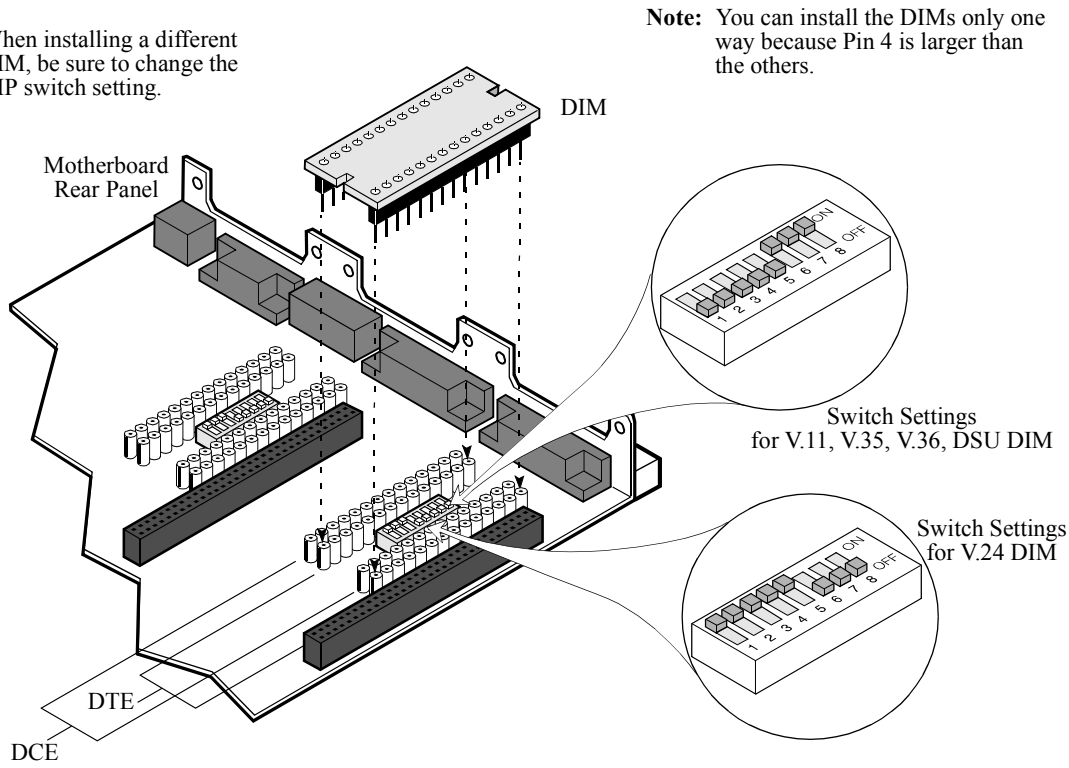


Figure 3-11. DIM Replacement and Switch Settings

Setting DIM DIP Switches

The two DIM DIP switches are set at the factory. If you need to reset them, refer to Figure 3-11 and the following table:

Switch Number	*V.11, V.35, V.36, DSU*	*V.24*
1	Off	On
2	Off	On
3	Off	On
4	Off	On
5	Off	On
6	On	Off
7	On	Off
8	On	Off

Adding or Removing SDRAM DIMMs

Figure 3-12 shows how to add or remove a SDRAM (synchronous DRAM) DIMM. Refer to Figure 3-10 for the location of the SDRAM DIMM, (Slot U66).

For instructions for removing the motherboard, refer to the "Accessing the Motherboard" section on page 3-16.

Caution

Some components used in the 6435/6455 are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

Mise en Garde

Certains composants du 6435/6455 sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Vorsicht

Einige im 6435/6455 verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

Note

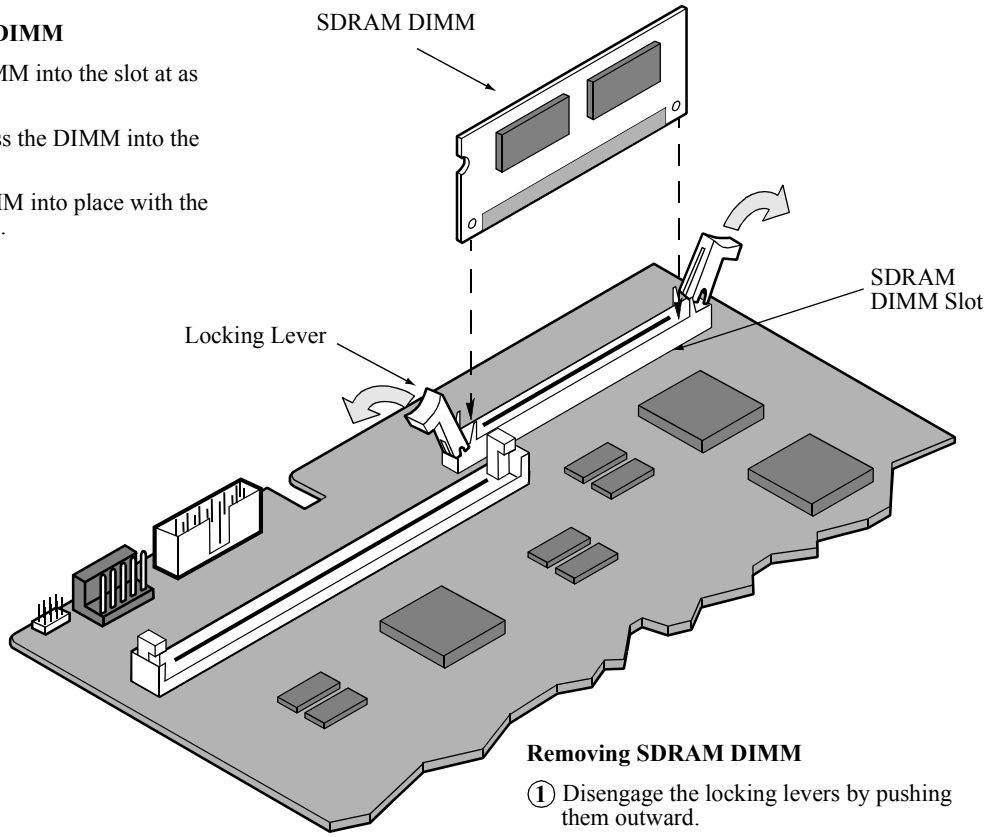
The location of the SDRAM DIMM is indicated on the motherboard as shown in Figure 3-12.

Adding SDRAM DIMM

① Insert the DIMM into the slot at as shown here.

② Carefully press the DIMM into the socket.

③ Lock the DIMM into place with the locking levers.



Removing SDRAM DIMM

① Disengage the locking levers by pushing them outward.

② Lift out the DIMM.

Figure 3-12. SDRAM DIMM Installation/Replacement

Adding/Removing a FLASH/Data Compression/ Encryption SIMM

Figure 3-13 shows how to add or remove a FLASH or Data Compression SIMM for the Vanguard 6435/6455. Refer to Figure 3-10 for the location of the SIMM slots:

- Data Compression SIMM or Encryption SIMM: Slot U108
- FLASH SIMM: Slot U57

Caution

Be careful when installing a Data Compression SIMM or a FLASH SIMM. These SIMM slots look identical and you may accidently place a SIMM in the wrong SIMM slot which could damage the equipment.

Caution

Some components used in the 6435/6455 are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

Mise en Garde

Certains composants du 6435/6455 sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Vorsicht

Einige im 6435/6455 verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

Note

The location of the Data Compression (DCC/DSP) SIMM/Encryption SIMM and the FLASH SIMM are indicated on the motherboard as shown in Figure 3-13.

To Install the FLASH SIMM:

Insert the SIMM into the connector at a slight angle, then straighten it and push the locking tabs through the holes.You will hear the clips click into place.

To Remove the FLASH SIMM:

Use your fingers to push back the two metal retaining clips and lift out the SIMM.

To Install the Data Compression or Encryption SIMM:

Push the SIMM into the connector, lining up the holes with the tab, allowing the metal clips to hold the SIMM in place.

To Remove the Data Compression or Encryption SIMM:

Use your fingers to push back the two metal retaining clips and lift out the SIMM.

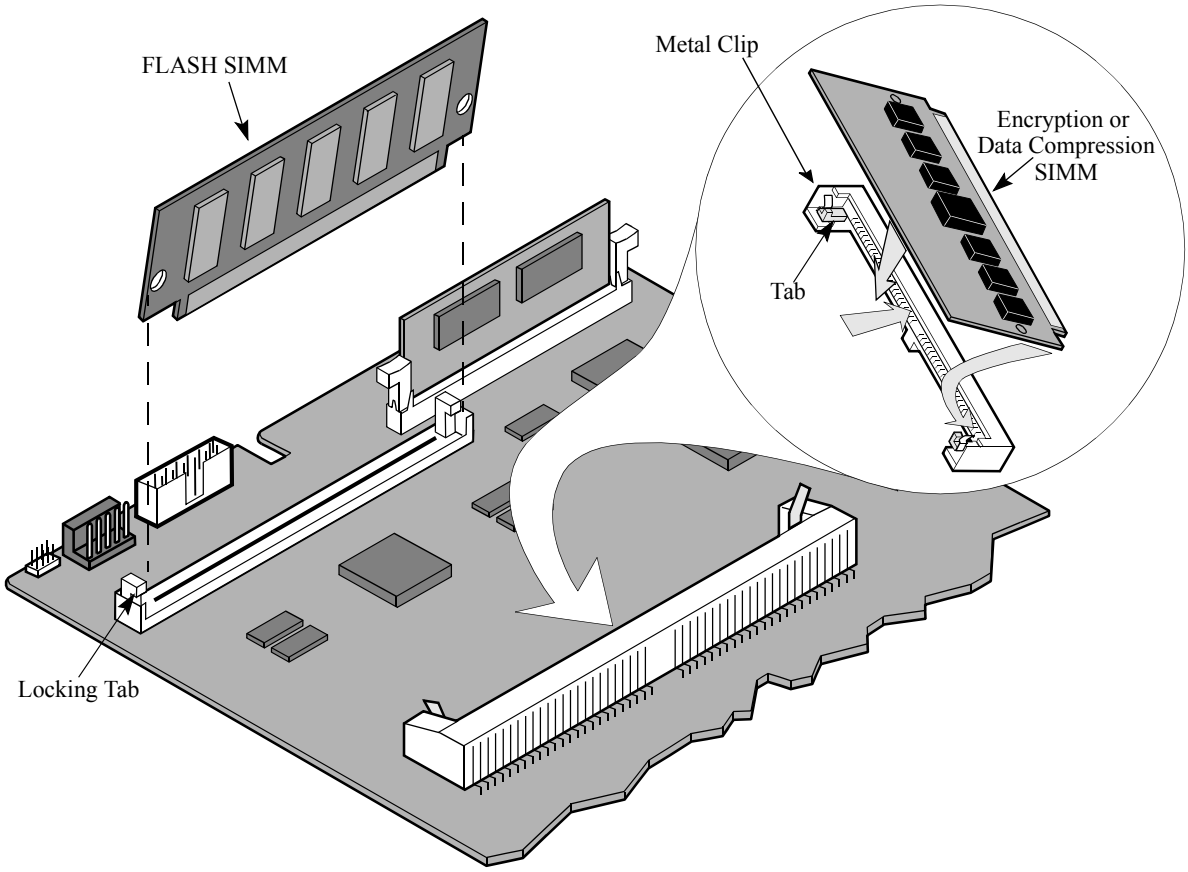


Figure 3-13. FLASH/Data Compression/Encryption SIMM Installation

Installing/Removing Enhanced Vanguard Daughtercards

Introduction

This section explains how to install an Enhanced Vanguard Daughtercard into a Vanguard 6435/6455 enclosure. For a detailed description of the 10/100BaseT Enhanced Vanguard Daughtercard, refer to the "Enhanced Vanguard Daughtercards" section in Chapter 2.

Note

Before you can install or replace an Enhanced Vanguard Daughtercard, you must first access the Vanguard 6435/6455 motherboard. For details of this procedure, refer to the "Accessing the Motherboard" section on page 3-16.

Caution

Some components used in the 6435/6455 are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

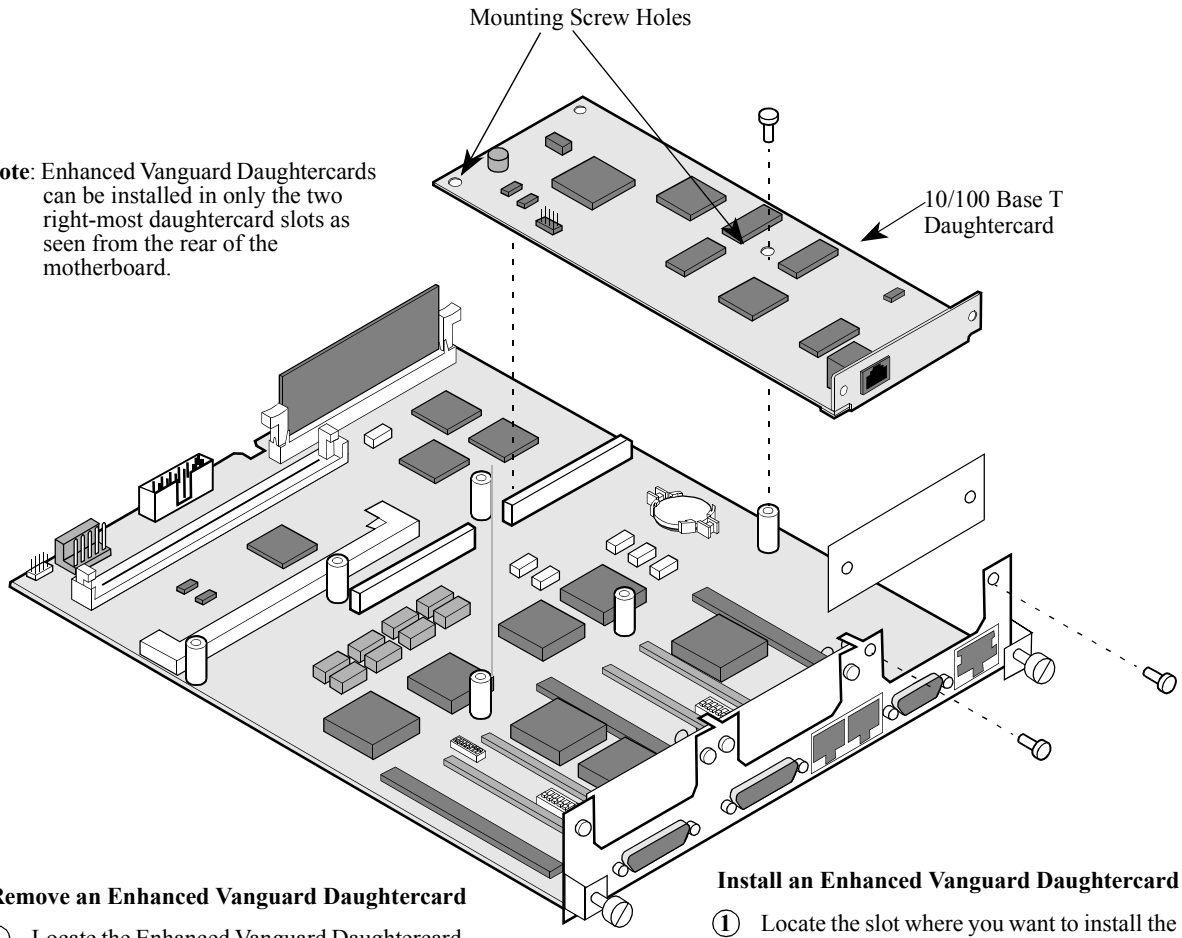
Mise en Garde

Certains composants du 6435/6455 sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Einige im 6435/6455 verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

Instructions

To install (and remove) Enhanced Vanguard Daughtercards, perform the steps as shown in Figure 3-14:



Note: Enhanced Vanguard Daughtercards can be installed in only the two right-most daughtercard slots as seen from the rear of the motherboard.

Remove an Enhanced Vanguard Daughtercard

1. Locate the Enhanced Vanguard Daughtercard you want to remove and loosen the captive screws that are holding it to the back panel.
2. Loosen and remove the two mounting screws.
3. Carefully lift out the daughtercard.

Install an Enhanced Vanguard Daughtercard

1. Locate the slot where you want to install the Enhanced Vanguard Daughtercard and remove the filler panel by loosening the captive screws.
2. Carefully position the Enhanced Vanguard Daughtercard over the connector. Press down firmly so the daughtercard connector seats properly with the motherboard connector.
3. Secure the Enhanced Vanguard Daughtercard with the two mounting screws and the two captive screws on the back panel.

Figure 3-14. Enhanced Vanguard Daughtercard Installation

Installing/Removing Vanguard 6455 Option Cards

Introduction

This section explains how to install an optional Option Card into a Vanguard 6455 enclosure. (Option Cards do not operate in a Vanguard 6435.) For a detailed description of the SDB 4-Port Sync/Async card, including information about DIP switch settings, turn to the "Vanguard 6455 Option Cards" section in Chapter 2.

Instructions

Figure 3-15 explains how to install an Option Card into a Vanguard 6455.

Warning

To prevent injury, be sure to power down the unit and disconnect the power cord before you remove the Option Card.

Avertissement

Pour éviter toute blessure, éteignez l'unité et déconnectez le cordon d'alimentation avant d'ôter la carte d'option.

Warnung

Um Verletzungen zu verhindern, schalten Sie das Gerät ab, und ziehen Sie den Netzstecker aus, bevor Sie die Option Card entfernen.

Caution

Make sure the power is off before installing the cards or the cards could be damaged.

Caution

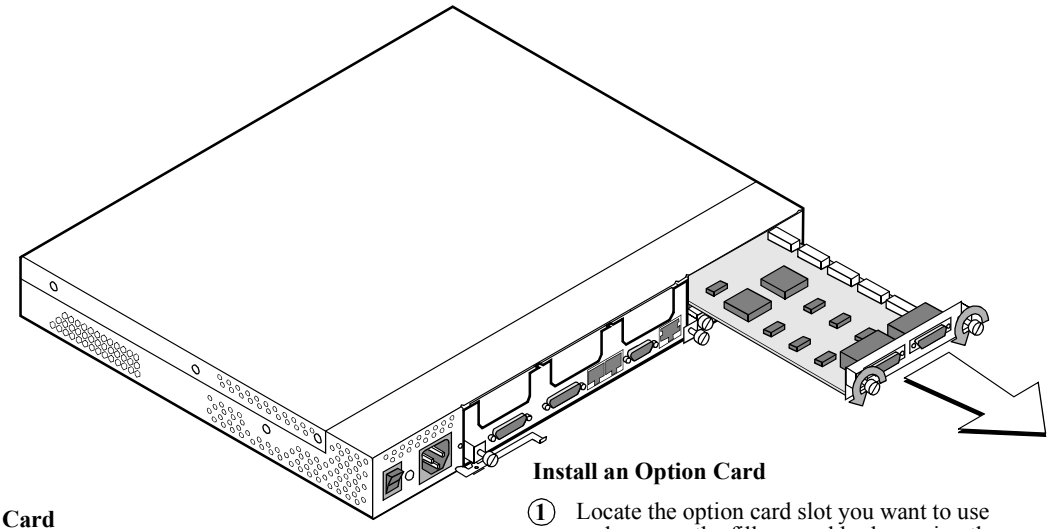
Some components used in the 6435/6455 are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.

Mise en Garde

Certains composants du 6435/6455 sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.

Vorsicht

Einige im 6435/6455 verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.



Remove an Option Card

1. Locate the option card you want to remove and loosen the captive screws.
2. Carefully slide out the option card.

Install an Option Card

1. Locate the option card slot you want to use and remove the filler panel by loosening the captive screws.
2. Carefully slide the option card into the card guides within the opening. Press into place, making sure the edge connectors seat properly.
3. On either side of the option card, tighten the two captive screws.

Figure 3-15. Installing/Removing a Vanguard 6455 Option Card

Installing/Removing the Lithium Battery

Introduction

Vanguard 6435/6455 uses a lithium battery on the motherboard to maintain the node's realtime clock. The battery is not used to store the configuration memory.

This section explains how to replace the battery.

Warning

Only qualified service personnel should perform the procedure described in this section. If the battery is installed incorrectly, it could explode after the Vanguard product is powered up, damaging the unit.

Avertissement

Seules des personnes qualifiées peuvent mettre en pratique les procédures décrites dans cette section. Si la batterie n'est pas correctement installée, elle risque d'exploser après la mise en marche du produit Vanguard et d'endommager l'unité.

Warnung

Die in diesem Abschnitt aufgeführten Vorgänge sollten ausschließlich von qualifiziertem Servicepersonal durchgeführt werden. Wenn die Batterie unsachgemäß installiert wird, kann sie nach dem Einschalten des Vanguard-Produkts explodieren und das Gerät beschädigen.

Note

After installing the battery, set the Vanguard 6435/6455's date and time. This is done via the CTP in the Update System Parameter menu.

Battery Type

Replace the lithium battery with lithium coin cell type CR2032 or its equivalent. These can be obtained where watch batteries are sold.

Battery Disposal

Dispose of the battery in compliance with applicable local regulations.

Routine Battery Replacement

The lithium battery should be replaced every two years. Follow the instructions in Figure 3-16 to replace the battery.

Before Removing/ Installing the Battery

Before you remove or install the battery, you must access the Vanguard 6435/6455 motherboard as described in the "Accessing the Motherboard" section on page 3-16.

Once you can see the motherboard, locate the battery as shown in Figure 3-10.

Removing/ Installing the Battery

Figure 3-16 shows how to install and replace the battery.

To remove the battery

Using your fingers, push the retaining tabs aside and pry the battery out of the holder.

To install the battery

Place the battery in the holder with the positive (+) side up, and press down until the retaining tabs click into place.

Note: When done, replace the motherboard as explained in the "Accessing the Motherboard" section on page 3-16.

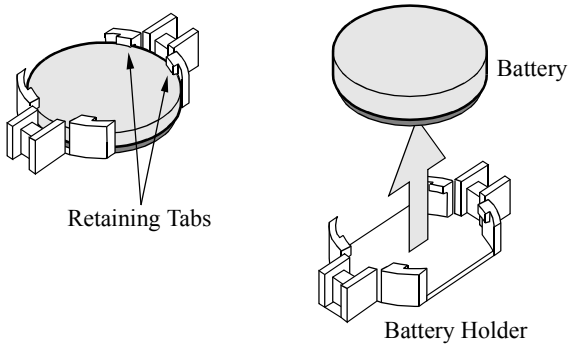


Figure 3-16. Replacing the Battery

Installing Flash and CMEM

Introduction

Release 6.2 and greater allows the Vanguard 6435 and 6455 to increase the FLASH memory and expand the CMEM area. Existing Vanguard 6435 and 6455's can be updated to 8 Mbyte SIMM as long as the bootprom is also updated. A new bootprom is required to support the 12mb Flash option with the 128 kbyte CMEM. To use 128k CMEM, 8 Mbyte SIMM must be installed and the bootprom updated.

Rules and Upgrade/ Downgrade procedures and considerations

These rules are based on expected operation. The upgrade and downgrade procedures and considerations are based on actual results from testing.

Rules

4MEG FLASH SIMM Present (or no flash present)

1.) Any combination of Bootproms and code images are acceptable.

Note:

6.1 Code ------- 5.1 Bootprom (or 5.2 Bootprom)

6.2 Code ------- 5.2 Bootprom (or 5.1 Bootprom)

8MEG Flash SIMM Present

2.) Any combination of Bootproms and Code must be <= 6.1 or;

Note

The 8MEG SIMM is not officially supported prior to release 6.2, however it can be installed in a 6455 running a 6.1 release without harm. It will simply be recognized and treated as a "4MEG SIMM".

3.) Any combination of Bootproms and Code Must be > =6.2

4.) Once you are upgraded to 6.2 with presence of 8MEG Flash SIMM you cannot go back cleanly. See Downgrade instructions.

Upgrade to 8MEG Flash SIMM

Method 1

This method is not preferred, but it may occur in the field, where customers may already be upgraded to 6.2, and probably have a 4MEG flash installed. They could determine later that they will need the 8MEG flash to support their operations.

Step	Description
1	Save CMEM (It is always recommended that you save CMEM).
2	The system is or has already been upgraded to 6.2 and has a 4MEG flash SIMM installed. At this point it does not matter if the bootprom has been upgraded or not. (rule 1). If Vanguide was used it will upgrade the bootprom, but other methods will not (TFTP, CLDR via Procomm, crossload). First insure that the bootprom is 5.2. If it is not, use Vanguide to load or reload a 6.2 image. Vanguide will detect and upgrade the bootprom. The node must be accessible via the CTP for vanguide to detect and upgrade the bootprom.

Step	Description
3	Power down the node and install the 8MEG flash SIMM. Power up the node. The node will come up, both flash banks will show "0" bytes and the CMEM will be cleared.
4	Use Vanguide only to download 6.2 image.
5	Download your saved CMEM.

Method 2

This is the cleanest way to accomplish the upgrade to an 8MEG flash SIMM and is the preferred method.

Step	Description
1	Save CMEM. (Testing has shown that the CMEM will be not be affected using this procedure, however it is always recommended that you save CMEM before any maintenance operation)
2	The 6455 is starting with 5.1 bootprom, 6.1 image and 4MEG flash. Install the 8MEG flash SIMM. Power up the node and copy or load a 6.1 image into the new flash bank.
3	Use Vanguide to upgrade the node to 6.2, this will also upgrade the bootprom. Insure that the node was accessible via CTP so that Vanguide can detect the bootprom version.
4	Completed! The node will be upgraded to 6.2 (both image and bootprom) with the CMEM intact.

Downgrade from 6.2 With 8MEG SIMM to 6.1 or Earlier

This can be done, but because you cannot mix bootproms and releases with the presence of an 8MEG flash SIMM (please refer to the “Rules and Upgrade/ Downgrade procedures and considerations” section on page 3-33) you must:

Step	Description
1	Save CMEM, then power down and remove the 8MEG SIMM.
2	Manually downgrade the bootprom to 5.1 (or earlier). Use the zap command and force coldload and send down the single file, example: "cougar_bootprom_cldr.xrc"
3	Coldload a 6.1 image.
4	If desired, you may reinstall the 8MEG flash SIMM and use normally.

Considerations

Regarding upgrades to release 6.2, it is recommended that method 2 should be used whenever possible.

1) When using Vanguide to upgrade to release 6.2, refuse the bootprom upgrade when asked, unless you have an 8MEG flash SIMM already installed. Then when upgrading to 8MEG is desired, follow recommendation "2" below.

2) If the node to be upgraded still has the 5.1 bootprom with a 6.2 image, it is recommended that you download a 6.1 image into the node and then go directly to method 2. This could happen if you used TFTP or Procomm, or Flash to Flash crossload to get 6.2 to the node.

Go directly to method 2 (valid for 8MEG SIMM inclusion).

Chapter 4
Powering Up Your Vanguard 6435/6455

Overview

Introduction

This chapter explains how to:

- Power up your Vanguard 6435/6455.
- Ensure that the unit powered up correctly and is up and running by reading the front panel display.
- Load the Vanguard 6435/6455 software.

Power Up Procedure

Introduction

This section explains how to power up the Vanguard 6435/6455.

Procedure

Follow these steps to power up your Vanguard 6435/6455.

Step	*Action*
1	Check that all the cards are fully inserted and secure.
2	Make sure that the AC power cord is plugged in.
3	Set the power switch to On.
4	Check that the fan is operating.
5	Check that the front panel LCD displays the proper messages as described in the next section.

To power down the Vanguard 6435/6455, simply set the power switch to Off.

Power Up Sequence

Introduction

One of two processes occur when you power up the Vanguard 6435/6455:

- The Vanguard 6435/6455 coldloads the operating software (Applications Ware) and then initiates a node boot.
- The Vanguard 6435/6455 initiates a node boot using previously loaded operating software (Applications Ware).

During the software loading and boot process, a series of messages appear on the front panel display. These message sequences are described below. If something other than these messages appear, or if the message **ERR: Bad FLASH** appears, a problem has been encountered.

For a description of all the front panel messages, refer to the “Front Panel Display Messages” section on page 4-6.

Coldloading the Software

This table shows the sequence of LCD messages that appear when a Vanguard 6435/6455 is coldloading the software:

Step	*Display Message*
1	BootPROM Vnn
2	Need Coldload
3	Erasing FLASH
4	Send FLASH Image
5	Writing to FLASH
6	Coldload Done
7	BootPROM Vnn
8	Loading FIPL
9	Loading FBIST
10	Testing Node
11	BootPROM Vnn
12	Loading FIPL
13	Loading ONS
14	Booting ONS
15	BootPROM Vnn
16	--- Node Up ---
Note: nn is the version number.	

Note

If the Vanguard 6435/6455 unexpectedly stops loading, it does not lock up. Instead, it restarts the load cycle from the beginning.

Booting the Node

This table shows the sequence of LCD messages that appear when a Vanguard 6435/6455 already contains the Applications Ware software and is being booted:

Step	Display Message
1	BootPROM Vnn
2	Loading FIPL
3	Loading FBIST
4	Testing Node
5	BootPROM Vnn
6	Loading FIPL
7	Loading ONS
8	Booting ONS
9	--- Node Up ---
Note: nn is the version number.	

Note

Digital Voice ports (Vanguard 6455) are booted twice when the node is warm booted. Two “port boot complete” messages are displayed.

Operating Front Panel Messages

Introduction

During normal operation, the Vanguard 6435/6455 displays a series of four messages on the front panel. They appear for several seconds and are rotated in sequence.

Operating Displays

This table lists the normal front panel messages:

Display Message	*Description*
--Node Up--	The node is running.
Vanguard 6435 or Vanguard 6455	The model type.
S5.4.nn [16 characters]	Indicates the software version running on the node including software feature set name (up to 16 characters).
CPU Util. nn%	Percentage of CPU capability being used.

Front Panel Display Messages

Description

This section consists of a table explaining all the Vanguard 6435/6455 front panel messages:

Display Message	Description
BootPROM Vn.n	Indicates the revision of the Boot Prom software. This is displayed after power up and when the node is reset.
Booting ONS	The node is booting (operating software is being started).
Coldload Done	When the image has successfully loaded into FLASH, this message appears for 5 seconds.
CPU Util. nn%	Percentage of CPU capability being used.
Writing to FLASH	The Cold Loader is loading an image into FLASH.
Erasing FLASH	The Coldloader is erasing FLASH. After this is complete, the Flash image can be sent to the node
ERR: Bad FLASH	An error occurred while the Cold Loader was loading an image into FLASH.
Loading FBIST	FBIST software is being loaded from FLASH to SDRAM for execution.
Loading FIPL	FIPL software is being loaded from FLASH to SDRAM for execution.
Loading ONS	The operating software is being loaded from FLASH to SDRAM for execution.
Need ColdLoad	The FLASH does not contain a valid software image and the node is waiting to be ColdLoaded.
--- Node Up ---	The node is up and running: • The operating software has begun multi-tasking. • The data ports are enabled. • Data can start passing.
S5.4 [16 characters]	Indicates the software version running on the node including software feature set name (up to 16 characters).
Send FLASH Image	The Cold Loader is waiting for a FLASH image to be sent to the node during the cold load procedure
Testing Node	FBIST is running diagnostic tests on the hardware.
Vanguard 6435 or Vanguard 6455	The model type.
Zap Mode	The diagnostic Zap mode is invoked. Force Coldboot or Clear CMEM commands can be selected.

Loading the Software

Introduction

This section briefly describes how to load the software into your Vanguard 6435/6455.

Note

After the software has been loaded, refer to the appropriate user document to configure and use the different software options.

Operating Software

The operating software is compressed in FLASH and loaded into SDRAM for execution. There are a variety of operating software feature sets available for the Vanguard 6435/6455.

- See the Software Release Notice accompanying your Vanguard 6435/6455 for feature information on the operating software available for your unit.
- See the *Software Installation and Download Guide* (Part Number T0028) for information on installing the operating software.

Optional Software

You can obtain Applications Ware Packages that can be tailored to your specific needs. The Applications Ware licenses available for Vanguard products are:

- IP+
- SNA+
- Multi-Service

Note

For details about the contents of the license upgrade packages and how they can be obtained, refer to the latest *Software Release Notice*. A license refers to both a legal document that allows a customer to use features and to the software that contains the features.

Appendix A
Specifications

Overview

Introduction

This appendix describes the physical and electrical specifications for the Vanguard 6435 and Vanguard 6455.

Dimensions

Figure A-1 shows the exterior dimensions of the Vanguard 6455.

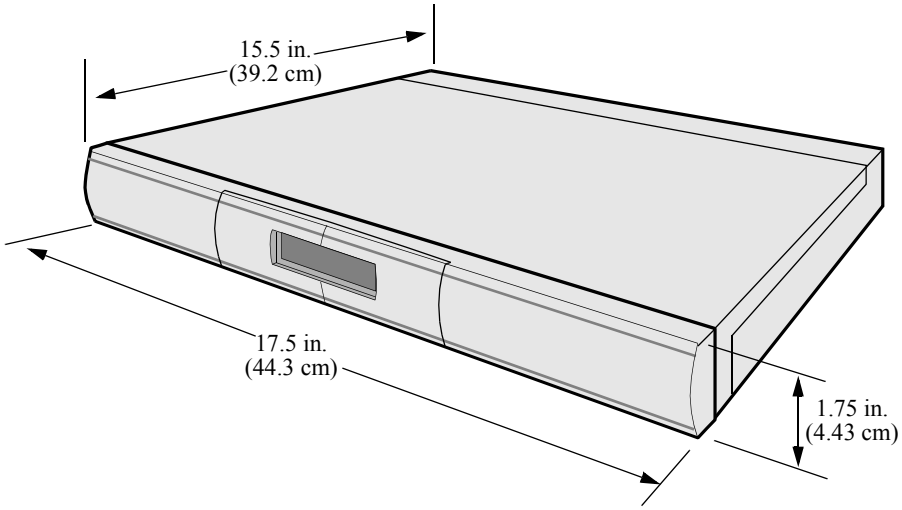


Figure A-1. Vanguard 6455 Exterior Dimensions

Figure A-2 shows the exterior dimensions of the Vanguard 6435.

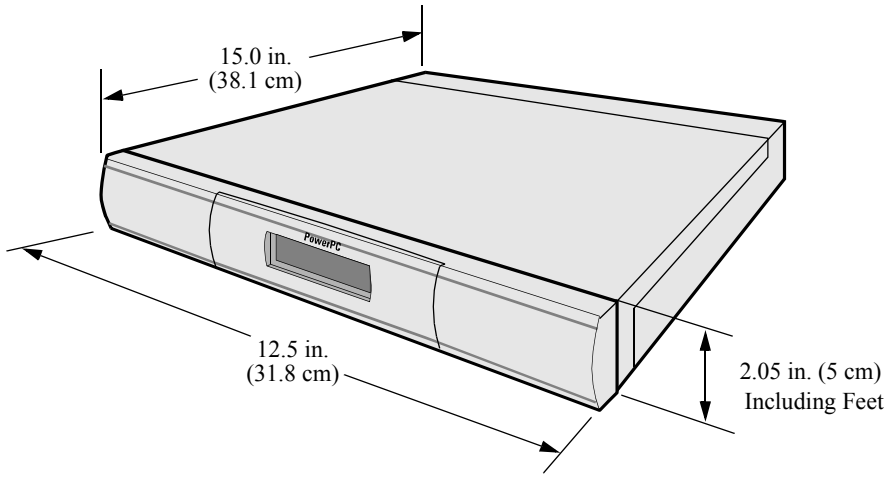


Figure A-2. Vanguard 6435 Exterior Dimensions

Weight

The Vanguard 6435/6455 weights are listed below:

Vanguard	*Weight*
6435 with three daughtercards installed.	8.1 lbs
6455 with three daughtercards and two feature cards installed.	13.2 lbs.

Environment

Operating temperature: 32° to 98° F (0° to 40° C)

Storage temperature: -40° to 158° F (-40° to 70° C)

Relative humidity: 5% to 90% (non-condensing)

Power Requirements

Input voltage 100 to 240 Vac

Input frequency: 50 to 60 Hz

Input current:

- 6435: 0.4 to 0.8 A
- 6455: 1.7 to 0.9 A

Maximum input power consumption:

- 6435: 52 W
- 6455: 90 W

Appendix B
Software License and Regulatory Information

Overview

Introduction

This appendix provides information about the following:

- FCC Part 68 and Telephone Company Procedures and Requirements
- Product Declarations and Regulatory Information

FCC Part 68 and Telephone Company Procedures and Requirements for DSU, T1, and ISDN Interfaces

Before You Begin

Before a Vanguard 6435/6455 can be connected to the network, you must do the following:

- Provide the local telephone company with the equipment's registration number
- Order the proper connections

How to Order Connections

To order the proper connections, provide the telephone company with the following information:

- Interface type
- Required USOC jack connector number
- Service code
- Facility interface codes

Interface Type	*USOC Jack Connector*	*Service Code*	*Facility Interface Code*
56-kbps digital interface	RJ48S	6.0F	04DU5-56
ISDN U Interface	RJ49C	6.0Y	02lS5
ISDN S/T Interface	--------	6.0F	02lS5
Fractional T1 Interface	RJ48C	6.0F	04DU9-BN 04DU9-2SN

Troubleshooting Your Connection

If any of your equipment is not operating correctly, immediately remove it from the telephone line before damaging the network. If the telephone company is aware of the problem, they may temporarily disconnect your service. Whenever possible, the telephone company notifies you in advance of the disconnection.

If advance notice is not feasible, you are notified as soon as possible. Once notified, you can correct the problem. If necessary, it is your right to file a complaint with the FCC.

Customer-Provided Telephone Equipment

FCC regulations and telephone company procedures prohibit connection of customer-provided equipment to telephone company-provided coin service (central office-implemented systems). Connection to party lines is subject to state tariffs.

Occasionally, the telephone company may make changes in their equipment, operations, or procedures. If these changes can affect your equipment or service, the telephone company provides written notice so that you can make the necessary changes to maintain uninterrupted service.

Contact your telephone company if you have any questions about your telephone line.

In some circumstances, the telephone company may ask you for information about the equipment that is connected to the telephone line. Within the United States (at the request of the telephone company), you should provide your equipment's FCC registration number. This number is located on the unit's label on the bottom of the unit.

Product Declarations and Regulatory Information

The following sections provide information about standards compliance, safety statements, and ISDN Type Approvals.

Warnings And Cautions

The following special notices apply to all equipment handling procedures in this installation guide.

Warning

Ports capable of connecting to ports on other apparatus are defined as Safety Extra Low Voltage (SELV). To conform with EN60950, ensure that these ports are only connected to ports of the same type on other apparatus.

Avertissement

Les ports qui sont susceptibles d'être connectés à des équipements sont désignés comme TBTS. Pour garantir la conformité à la norme EN 60950, n'interconnecte ces ports qu'avec des ports du même type sur des autres matériels.

Warnung

Anschlusse, die mit anderen Geraten verbindet werden konnen, sind als SELV beschrieben. Um Konformitat mit EN 60950 zu versichern, sichern Sie es, daß diese Anschlusse nur mit den des selben Type auf anderen Geraten verbindet werden.

CE Marking

One of the marks in the following diagram appears on each of the Vanguard products that are ISDN compatible, and the statement that follows explains its significance.

CE

Figure B-1. CE Mark

This product is CE marked to indicate compliance with the following European Directives:

- 73/23/EECLow Voltage Directive (Safety)
- 1999/5/EC Radio & Telecom Terminal Equipment (R&TTE)
- 89/336/EECEMC Directive

Copies of the full Declaration of Conformity are available at the following URL:

http://www.vanguardms.com/

Declarations of Conformity

English

Declaration of Conformity:

Hereby, VanguardMS declares that this Vanguard Router is in compliance with the requirement and other relevant provisions of Directive 1999/5/EC.

Danish

Konformitetserklæring:
Hermed erklærer VanguardMS at indestående Vanguard Router er i overensstemmelse med de grundlæggende krav og de relevante punkter i direktiv 1999/5/EF.

Dutch

Verklaring van overeenstemming:

Hierbij verklaart VanguardMS dat diens Vanguard Router voldoet aan de basisvereisten en andere relevante voorwaarden van EG-richtlijn 1999/5/EG.

Finnish

Vaatimustenmukaisuusvakuutus:

VanguardMS vakuuttaa täten, että Vanguard Router on direktiivin 1999/5/EC keskeisten vaatimusten ja sen muiden tätä koskevien säännösten mukainen

French

Déclaration de conformité :

Par la présente, VanguardMS déclare que ce routeur Vanguard est conforme aux conditions essentielles et à toute autre modalité pertinente de la Directive 1999/5/CE.

German

Konformitätserklärung:

Hiermit erklärt VanguardMS dass der Vanguard Router die grundlegenden Anforderungen und sonstige maßgebliche Bestimmungen der Richtlinie 1999/5/EG erfüllt.

Greek

Δήλωση Συμμόρφωσης:
Δια του παρόντος, η εταιρεία VanguardMS δηλώνει ότι η παρούσα συσκευή (δρομολογητής) Vanguard Router πληροί τις βασικές απαιτήσεις και άλλες βασικές προϋποθέσεις της Οδηγίας 1999/5/ΕΚ.

Italian

Dichiarazione di conformità:
Con la presente VanguardMS dichiara che il router Vanguard soddisfa i requisiti essenziali e le altre disposizioni pertinenti della direttiva 1999/5/CE.

Portuguese

Declaração de Conformidade:
Através da presente, a VanguardMS declara que este encaminhador Vanguard se encontra em conformidade com os requisitos essenciais e outras disposições relevantes da Directiva 1999/5/CE.

Spanish

Declaración de conformidad:
Por la presente declaración, VanguardMS declara que este encaminador Vanguard cumple los requisitos esenciales y otras cláusulas importantes de la directiva 1999/5/CE.

Swedish

Överensstämmelseförklaring:
VanguardMS förklarar härmed att denna Vanguardrouter överensstämmer med de väsentliga kraven och övriga relevanta stadganden i direktiv 1999/5/EG.

Industry Canada

The following information includes the Industry Canada statement regarding ISDN and T1 equipment use.

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service might be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, could give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution can be particularly important in rural areas.

Caution

Users must not attempt to make such connection themselves, but must contact the appropriate electric inspection authority, or electrician, as appropriate.

Mise en Garde

Les utilisateurs ne doivent pas établir de telles connexions eux-mêmes. Ils doivent contacter une personne compétente ou un électricien.

Vorsicht

Benutzer sollten nicht versuchen, diese Verbindung selbst herzustellen, sondern dazu die zuständige Aufsichtsbehörde für Elektroinstallationen bzw. einen Elektroinstallateur kontaktieren.

Notification of Canadian Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Radio Frequency Interference Regulations

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules, CISPR 22 and EN 55022. These limits are designed to provide reasonable protection against interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician to help.

Changes or modifications not expressly approved by VanguardMS could void the user's authority to operate the equipment.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

This product was FCC certified under test conditions that included use of shielded data terminal equipment cables. Use of different cables will invalidate FCC certification and increase the risk of causing interference to radio and TV reception.

You can obtain the proper cables from VanguardMS.

Introduction

The following sections apply to U.S.A. customers only. Non-U.S.A. customers with questions or concerns regarding return procedures should contact their Vanguard Managed Solutions subsidiary or distributor.

Equipment Return Procedures

If you have questions about equipment return procedures, on-site service or unit exchange service call the Vanguard Managed Solutions Technical Support Center at (800) 544-0062 for advice and assistance.

In Case of Damage

If the equipment is damaged in transit, contact the shipper.

If you have additional concerns in case of failure, about missing parts, or to return equipment, contact your nearest Vanguard Managed Solutions representative.

For Locations	*Contact...*
Inside the United States	Vanguard Managed Solutions 575 West Street Mansfield, MA 02048-1193 Phone (800) 544-0062.
Outside the United States	the nearest VanguardMS distributor. For a listing of our Sales and Service Offices, visit our Web site at: **http://www.vanguardms.com/**

Expiration of Lease

To return equipment upon expiration of a lease agreement, contact the Vanguard Managed Solutions Support Center at (800) 544-0062 for return authorization and instructions. You will be asked to provide the following information:

- Product name and description
- Serial number
- Customer order number
- Reason for return

Factory Repair

To return equipment for factory repair, call the Vanguard Managed Solutions Technical Support Center at (800) 544-0062, for return authorization and instructions. When you call, you will be given a Return Material Authorization (RMA) control number. Mark this number clearly on the shipping container for ease of identification and faster service. The RMA control number provides a convenient tracking reference for both parties. Please have the following information available for each piece of equipment you return:

- Product name and description
- Serial number
- Failure symptoms

Packaging Guidelines for Equipment Return

Data communications equipment or parts that are to be returned to VanguardMS for any reason must be properly packaged to prevent damage in shipment and handling.

If the original packing material and shipping container are available, reuse these items to return equipment. If these items are not available, it is your responsibility to package the contents in a manner that protects the equipment from damage during normal shipping and handling. Responsibility for damage to equipment during transit must be resolved between you and the carrier. VanguardMS can provide you with specific packaging instructions upon request.

Index

Numerics

10/100BaseT Enhanced Vanguard Daughtercard
  connector pinouts 2-20
  LEDs 2-20
2 Port Voice FXS Daughtercard 2-14, 2-15
56 K DSU/CSU Daughtercard 2-12
6435
  features 1-3
  port numbers 2-3
  serial numbers 2-5
6435/6455
  adding/replacing components 3-15
  DIMs 2-7
  enclosure 2-2
  operating environment 3-4
  port numbers 3-9
  rack mount installation 3-6
  rear panel 2-3
  shipping contents 3-2
  standalone installation 3-4
6455
  features 1-3
  port numbers 2-3
  serial numbers 2-5

A

Adding Components 3-15
Applications
  Virtual Private Network (VPN) 1-10
  Voice over Frame Relay 1-10
  Voice over IP 1-10
ATM
  Connector Pinouts 2-23
  E1 Version 2-23
  EDC Switch Settings 2-22
  Enhanced Daughtercards 2-22
  T1 Version 2-22
Audience vii
Avertissement xi

B

Battery
  disposal 3-31
  replacement schedule 3-32
  replacement type 3-31
Besondere Hinweise
  Beschreibung xi
BSC 3270-to-LLC2 (SNA) Conversion 1-15
  Dynamic Port Creation Heap Size 1-16

C

Cabling
  daughtercards 3-14
  option cards 3-14
  rear panel ports 3-10
Canadian Regulatory Requirements B-7
Connectors 2-14

D

Data Compression SIMM 2-9
  add/remove 3-25
Daughtercard
  2 Port Voice FXS 2-14, 2-15
  56 K DSU/CSU 2-12
  cabling 3-14
  compatibility 2-11
  DIM 2-12
  Dual E&M 2-17
  FT1/FE1 2-16
  G.SHDSL 2-18
  ISDN BRI-ST 2-13
  ISDN BRI-U 2-12
  list 1-5, 2-7, 2-11
  RemoteVU 2-14
  remove/replace 3-15
  V.34 Modem 2-17
  V.90 Modem 2-17
  Voice FXS/FXO 2-14
DIM Daughtercard 2-12
DIM DIP Switches 2-8, 2-28
DIMs 2-7, 2-28
  add/remove 3-21
  DIP switch setting 3-22
Dual E&M Daughtercard 2-17

E

Electromagnetic Radiation
  requirements B-7
Enclosure 2-2
Encryption SIMM 2-9
Enhanced Vanguard Daughtercard 1-5, 2-19, 2-26
  add/remove 3-27
  ATM 2-22
Equipment return 1
  packaging 2

F

Factory repair 2
Fan 3-8
Features 1-3
Flash and CMEM installation 3-33
FLASH SIMM 2-9
  add/remove 3-25
Front Panel Messages
  booting the node 4-4
  coldloading 4-3
  list 4-6
  normal operations 4-5
FT1/FE1 Daghtercard 2-16

H

Hardware Specifications A-1
Heat 3-8

I

Inlet Temperature 3-8
Installation Instructions
  rack mount version 3-7
  standalone version 3-5
ISDN BRI-S/T Daughtercard 2-13
ISDN BRI-U Daughtercard 2-12

L

Lease expiry 1
Loading Software 4-7

M

Messages spéciaux x
  Important x
Mise en garde x
Motherboard 2-6
  components 2-6
  remove/replace 3-16

O

Operating Environment 3-4
Operating Software 4-7
Option Card
  add/remove 3-29
  cabling 3-14
  SDB4 2-27
  Token Ring 2-29
  Voice Server 2-30
  Y-cable 3-14
Ordering Connections
  facility interface code B-2
  interface type B-2
  service code B-2
  USOC jack connector B-2

P

Ports
  numbers 3-9
  pinouts 3-10
Power Up Sequence 4-2
Product Declarations B-4

R

Regulatory Information B-4
  Canadian requirements B-7
  Industry Canada B-7
RemoteVU Daughtercard 2-14
Remove/Replace
  components 3-15
  daughtercard 3-15
  motherboard 3-16
  option card 3-29

S

SDB4 Option Card 2-27
  DIMs 2-28
  ports 2-27
SDRAM DIMM
  add/remove 3-23
Shipping Contents 3-2
simboli speciali
  descrizione xi
SIMM
  Data Compression 2-9
  Encryption 2-9
  FLASH 2-9
Software
  operating 4-7
Software Loading 4-7
Special notices
  description ix
Specifications A-1
Switch
  DIM DIP 2-8, 2-28
  test mode 2-8

T

Telephone Company Procedures B-2
Temperature 3-8

Test Mode Switch 2-8
Thermal Considerations 3-8
Thermal Shutdown 3-8
Token Ring Option Card 2-29, 2-30
    LED 2-29
    port assignments 2-29
Troubleshooting
    connections B-2

U

Unpacking
    parts list 3-2

V

V.34 Modem Daughtercard 2-17
Video (RemoteVU) Daughtercard 2-14
Voice FXS/FXO Daughtercard 2-14
Voice Server Card 2-26
    connectors 2-32
    T1/ E1 Versions 2-31
Vorsichtshinweis, Beschreibung xi

W

Warnhinweis, Beschreibung xi
WICHTIG-Hinweis, Beschreibung xi